FURUNO

# INSTALLATION MANUAL

## MARINE RADAR/ARPA

MODEL **FAR-2137S/2837S/2137S-BB**

FURUNO ELECTRIC CO., LTD.
NISHINOMIYA, JAPAN

PRINTED IN JAPAN

© FURUNO ELECTRIC CO., LTD.

9-52 Ashihara-cho,
Nishinomiya, Japan

Telephone : 0798-65-2111
fax : 0798-65-4200

Your Local Agent/Dealer

All rights reserved. Printed in Japan

FIRST EDITION : APR . 2004
B : JUN . 14, 2004

PUB.No. IME-35210-B

( TATA ) FAR-2137S/BB/2837S

*0001486880 1*

*IME35210B00*

# ⚠ SAFETY INSTRUCTIONS

## ⚠ WARNING

### Radio Frequency Radiation Hazard

The radar antenna emits electromagnetic radio frequency (RF) energy which can be harmful, particularly to your eyes. Never look directly into the antenna aperture from a close distance while the radar is in operation or expose yourself to the transmitting antenna at a close distance.

Distances at which RF radiation levels of 100 and 10 W/m$^2$ exist are given in the table below.

**Note:** If the antenna unit is installed at a close distance in front of the wheel house, your administration may require halt of transmission within a certain sector of antenna revolution. This is possible–Ask your FURUNO representative or dealer to provide this feature.

| Radiator type | Distance to 100 W/m$^2$ point | Distance to 10 W/m$^2$ point |
|---|---|---|
| SN30AF | 1.2 m | 9.5 m |
| SN36AF | 0.7 m | 8.3 m |

## ⚠ WARNING

**Do not open the equipment unless totally familiar with electrical circuits and service manual.**

**ELECTRICAL SHOCK HAZARD**

Only qualified personnel should work inside the equipment.

**Wear a safety belt and hard hat when working on the antenna unit.**

Serious injury or death can result if someone falls from the radar antenna mast.

**Construct a suitable service platform from which to install the antenna unit.**

Serious injury or death can result if someone falls from the radar antenna mast.

**Turn off the power at the mains switchboard before beginning the installation.**

Fire, electrical shock or serious injury can result if the power is left on or is applied while the equipment is being installed.

**Do not install the monitor unit, processor unit or control unit where they may get wet from rain or water splash.**

Water in the units can result in fire, electrical shock, or damage the equipment.

## ⚠ WARNING

**Be sure that the power supply is compatible with the voltage rating of the equipment.**

Connection of an incorrect power supply can cause fire or damage the equipment .

**Use only the specified power cable.**

Fire or damage to the equipment can result if a different cable is used.

## ⚠ CAUTION

**Attach securely protection earth to the ship's body.**

The protection earth (grounding) is required to the AC power supply to prevent electrical shock.

**Observe the following compass safe distances to prevent deviation of a magnetic compass:**

| | Standard compass | Steering compass |
|---|---|---|
| Antenna Unit (30 kw) | 3.95 m | 2.55 m |
| Monitor Unit (MU-201CR) | 1.55 m | 1.00 m |
| Monitor Unit (MU-231CR) | 1.85 m | 1.20 m |
| Processor Unit (RPU-013) | 1.35 m | 0.85 m |
| Control Unit (RCU-014) | 0.30 m | 0.30 m |
| Control Unit (RCU-015) | 0.95 m | 0.60 m |
| Control Unit (RCU-016) | 0.65 m | 0.45 m |
| Power Supply Unit (PSU-007) | 0.85 m | 0.55 m |
| Memory Card Interface Unit (CU-200) | 0.90 m | 0.60 m |
| RJB-001 | 1.10 m | 0.70 m |
| Junction Box (RJB-001) | 1.10 m | 0.70 m |
| Switching Hub (HUB-100) | 1.00 m | 0.60 m |

## ⚠ CAUTION

**After fixing the antenna radiator, be sure to remove the guide pins.**

Injury may result if the guide pins loosen and fall.

DO NOT lift the antenna unit by the radiator; lift it by the hoist rings. (Be sure to remove rings after hoisting the antenna unit.)

# TABLE OF CONTENTS


**EQUIPMENT LISTS ..... iv**

**SYSTEM CONFIGURATION ..... vi**

**1. MOUNTING ..... 1-1**
1.1 Antenna Unit ..... 1-1
1.2 Monitor Unit ..... 1-7
1.3 Power Supply Unit ..... 1-11
1.4 Control Unit ..... 1-12
1.5 Processor Unit ..... 1-15

**2. WIRING ..... 2-1**
2.1 Interconnection ..... 2-1
2.2 Antenna Unit ..... 2-2
2.3 Monitor Unit ..... 2-7
2.4 Processor Unit ..... 2-8
2.5 Power Supply Unit ..... 2-12
2.6 Changing AC Power Specifications of Processor Unit ..... 2-12

**3. SETTING AND ADJUSTMENT ..... 3-1**
3.1 DIP Switch Setting ..... 3-1
3.2 Initializing tuning ..... 3-2
3.3 Heading Alignment ..... 3-3
3.4 Adjustment Sweep Timing ..... 3-5
3.5 Suppressing Main Bang ..... 3-6
3.6 Other Settings ..... 3-7

**4. INSTALLING OPTIONAL EQUIPMENT ..... 4-1**
4.1 Gyro Converter GC-10 ..... 4-1
4.2 Memory Card Interface Unit ..... 4-9
4.3 DVI-RGB Conversion Kit ..... 4-13
4.4 BNC Converter Converter ..... 4-15
4.5 Switching Hub ..... 4-16

**5. INPUT/OUTPUT DATA ..... 5-1**

**INSTALLATION MATERIALS, ACCESSORIES, SPARE PARTS ..... A-1**

**OUTLINE DRAWINGS ..... D-1**

**INTERCONNECTION DIAGRAM ..... S-1**

# EQUIPMENT LISTS

## Standard Supply

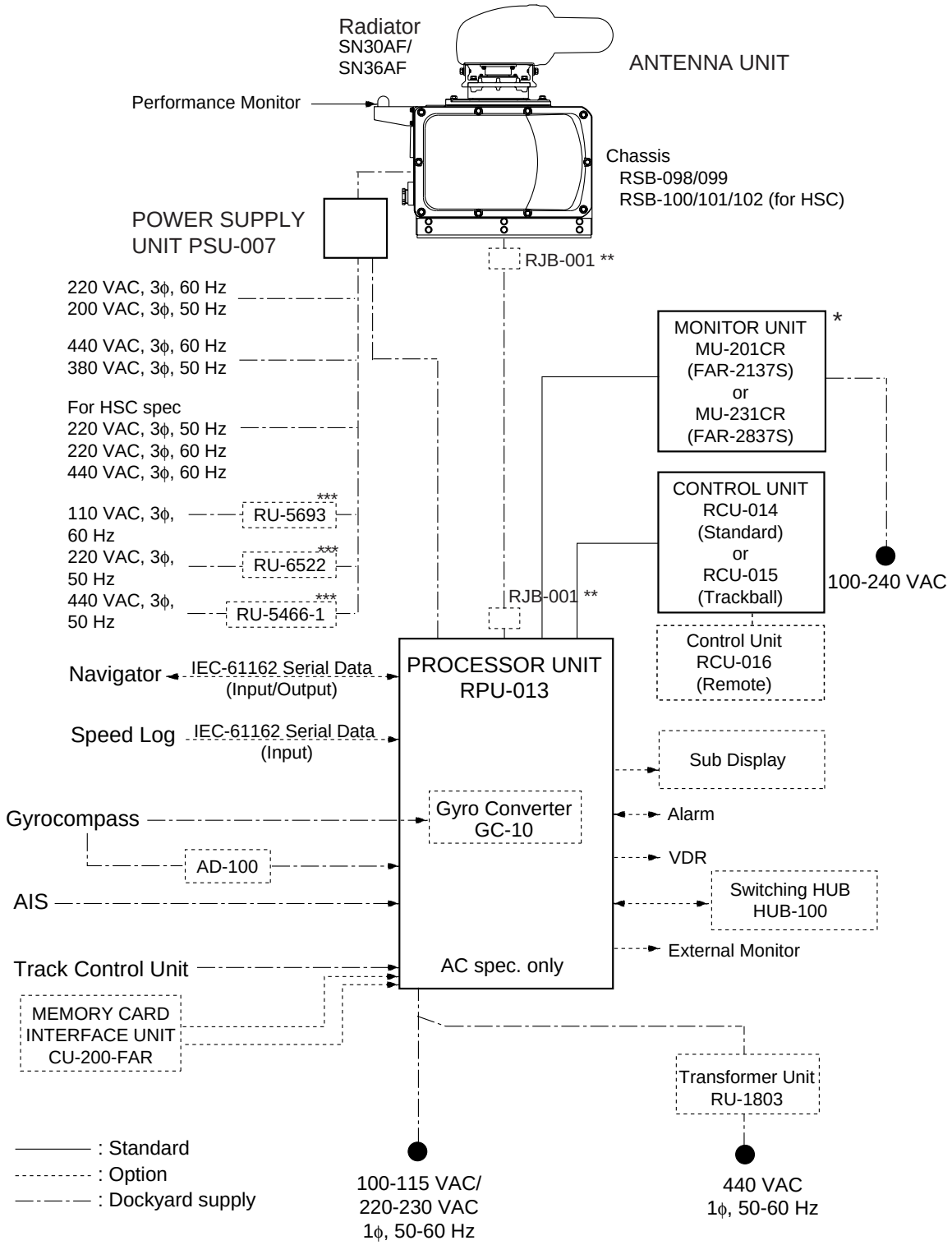
| Name | Type | Code No. | Qty | Remarks | |
|---|---|---|---|---|---|
| Antenna Unit | SN30AF | - | 1 | Radiator | |
| | SN36AF | - | | | |
| | RSB-098 | - | 1 | 200 VAC 3ϕ 50 Hz,<br>220 VAC 3ϕ 60 Hz | Antenna Chassis |
| | RSB-099 | - | | 380 VAC 3ϕ 50 Hz,<br>440 VAC 3ϕ 60 Hz | |
| | RSB-100 | - | | 220 VAC, 3ϕ, 50 Hz | Antenna Chassis for HSC |
| | RSB-101 | - | | 220 VAC, 3ϕ, 60 Hz | |
| | RSB-102 | - | | 440 VAC, 3ϕ, 60 Hz | |
| Power Supply Unit | PSU-007 | - | 1 | | |
| Monitor Unit | MU-201CR | - | 1 | For FAR-2137S | |
| | MU-231CR | | | For FAR-2837S | |
| Processor Unit | RPU-013 | - | 1 | AC type | |
| Control Unit | RCU-014 | - | 1 | Standard type | |
| | RCU-015 | | | Trackball type | |
| Installation Materials* | CP03-27201 | 008-538-720 | 1 | For antenna unit | |
| | CP03-25700 | 000-080-435 | 1 | 15 m signal cable RW-9600 | |
| | CP03-25710 | 000-080-436 | | 30 m signal cable RW-9600 | |
| | CP03-25720 | 000-080-437 | | 50 m signal cable RW-9600 | |
| | CP03-25730 | 000-082-191 | | 40m signal cable RW-9600 | |
| | CP03-25800 | 000-080-434 | 1 | Cable assy. for monitor unit | |
| | CP03-25602 | 008-535-940 | 1 | For RPU-013, AC set | |
| | CP03-27301 | 008-538-740 | 1 | For PSU-007 | |
| Accessories* | FP03-09810 | 008-536-010 | 1 | For monitor unit | |
| | FP03-09850 | 008-535-610 | 1 | For RCU-014 | |
| | FP03-09860 | 008-535-690 | | For RCU-015/016 | |
| | FP03-10101 | 008-538-730 | 1 | For antenna unit | |
| Spare Parts* | SP03-14404 | 008-535-910 | 1 | For processor unit 100 VAC set | |
| | SP03-14405 | 008-535-920 | 1 | For processor unit 220 VAC set | |
| | SP03-14401 | 008-535-990 | | For monitor unit, AC set | |

*: See lists at the end of this manual.

## Optional Equipment

| Name | Type | Code No. | Remarks | |
|---|---|---|---|---|
| Gyro Converter | GC-10-2 | 000-080-440 | See chapter 4. | |
| Performance Monitor | PM-51 | 000-081-261 | Mandatory for IMO radar | |
| Transformer Unit | RU-1803 | - | For processor unit, 440 VAC → 100 VAC | |
| | RU-3305 | - | For de-icer , 110/115/220/230 VAC → 100 VAC | |
| | RU-5693 | - | For RSB-098/099, 110 V →220 VAC | Not available for HSC |
| | RU-6522 | - | For RSB-098/099, 220 V →200 VAC | |
| | RU-5466-1 | - | For RSB-098/099, 440 V →220 VAC | |
| Sub Display | FMD-8010 | - | | |
| Memory Card Interface Unit | CU-200-FAR | 000-081-568 | W/CP03-27430, See chapter 4. | |
| External Buzzer | OP03-21 | 000-030-097 | | |
| Control Unit | RCU-016 | 000-080-299 | Remote type, W/FP03-09860 | |
| RAM Card | 00RAM08MC-005 | 004-376-740 | 8 MB | |
| DVI-RGB Conversion Kit | OP03-180 | 008-536-070 | See chapter 4. | |
| Cable Assy. | XH10P-W-5P L=20M | 000-149-057 | Between processor and control unit | 20 m |
| | XH10P-W-5P L=30M | 000-149-058 | | 30 m |
| | XH10P-W-5P-A L=10M | 000-149-050 | Between control units, 10 m | |
| | XH10P-W-5P-A L=20M | 000-149-051 | Between control units, 20 m | |
| | XH10P-W-5P-A L=30M | 000-149-052 | Between control units, 30 m | |
| | DVI-D/D S-LINK 10M | 000-150-200 | Monitor-Processor, 10m | |
| | S03-9-5 | 008-206-640 | For external radar, 5 m, 8-8P | |
| | S03-9-10 | 008-206-650 | For external radar, 10 m, 8-8P | |
| | S03-9-15 | 008-209-160 | For external radar, 15 m, 8-8P | |
| LAN Cable Kit (with armor) | CP03-28900 | 000-082-658 | FR-FTPC-CY 10 m | Modular connector MPS588-C, 2pcs |
| | CP03-28910 | 000-082-659 | FR-FTPC-CY 20 m | |
| | CP03-28920 | 000-082-660 | FR-FTPC-CY 30 m | |
| Accessories | FP03-09820 | 008-535-560 | Hanger assy. for MU-201CR | |
| | FP03-09830 | 008-536-020 | Hanger assy. for MU-231CR | |
| Hand Grip | FP03-09840 | 008-535-570 | For monitor unit | |
| Dust Cover | 03-163-1201 | 100-307-260 | For MU-201CR | |
| | 03-163-2101 | 100-307-270 | For MU-231CR | |
| Clamp Plate | OP03-182 | 008-535-620 | For RCU-014 | |
| Flush Mount Kit | FP03-09870 | 008-535-630 | For control unit RCU-014/015/016 | |
| Coupling Pedestal | OP03-183 | 008-535-640 | For RCU-014&MU-201CR | |
| | OP03-184 | 008-535-650 | For RCU-014& MU-231CR | |
| | OP03-185 | 008-535-660 | For RCU-014 | |
| Desktop Mount Kit | FP03-10201 | 008-539-530 | For CU-200 | |
| Console Mount Kit | FP03-10202 | 008-539-540 | For CU-200 | |
| BNC connector converter | DSUB-BNC-1 | 000-148-528 | For VDR | |
| Junction Box | RJB-001 | - | For more than 100m antenna cable | |
| Switching Hub | HUB-100 | - | | |

# SYSTEM CONFIGURATION




*: For FAR-2137S-BB, a monitor unit is prepared by user. See page 1-7.
**: Used for antenna cable more than 100 m.
***: Not available for HSC spec.

Category of Units
Antenna Unit: Exposed to weather
All other units: Protected from weather

# 1. MOUNTING

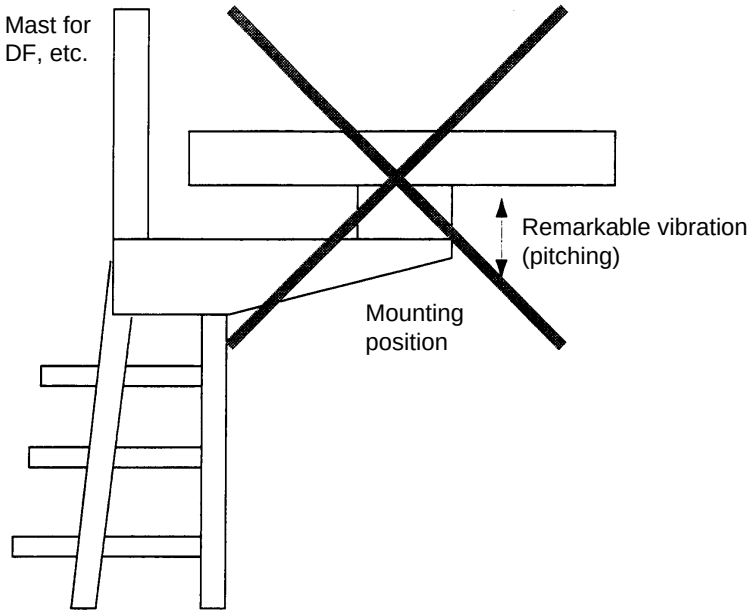
## 1.1 Antenna Unit

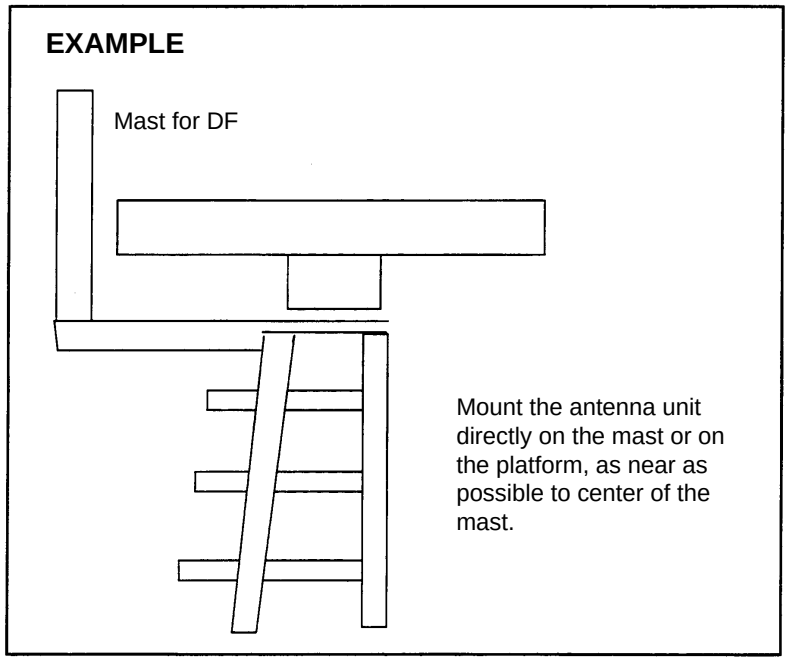
### Mounting considerations

- The antenna unit is generally installed either on top of the wheelhouse, on the radar mast, or on a suitable platform. Locate the antenna unit where there is a good all-round view.
- No funnel, mast or derrick should be within the vertical beamwidth of the antenna unit in the bow direction, especially zero degrees ±5°, to prevent blind sectors and false echoes on the radar picture.
- It is rarely possible to place the antenna unit where a completely clear view in all directions is available. Thus, you should determine the angular width and relative bearing of any shadow sectors for their influence on the radar at the first opportunity after fitting.
- Locate a direction finder antenna clear of the antenna unit to prevent interference to the direction finder. A separation of more than two meters is recommended.
- To lessen the chance of picking up electrical interference, avoid where possible routing the signal cable near other onboard electrical equipment. Also avoid running the cable in parallel with power cables.
- A magnetic compass will be affected if the antenna unit is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent deviation of the magnetic compass.
- Do not paint the radiator aperture, to ensure proper emission of the radar waves.
- The signal cable run between the antenna and processor units is available in lengths of 15 m (standard), 30 m and 50 m. Whatever length is used it must be unbroken; namely, no splicing allowed.
- The antenna base is made of cast aluminum. To prevent electrolytic corrosion of the antenna base, use the seal washers and corrosion-proof rubber mat and ground the unit with the ground wire (supplied).
- Deposits and fumes from a funnel or other exhaust vent can adversely affect the aerial performance and hot gases may distort the radiator portion. The antenna unit must not be mounted where the temperature is more than 70°C.
- Leave sufficient space around the unit for maintenance and servicing. See the antenna unit outline drawing for recommended maintenance space.

## Installation precaution for S-band antenna unit

If an S-band antenna unit is mounted near the end of a platform to provide sufficient rotation clearance for the radiator, the antenna unit, because of its weight, swings up and down by ship's vibration and rolling. This exerts excessive levels of stress at the base of the radiator, which can damage the radiator. To prevent this, relocate the antenna unit, or if relocation is not possible, reinforce the platform.



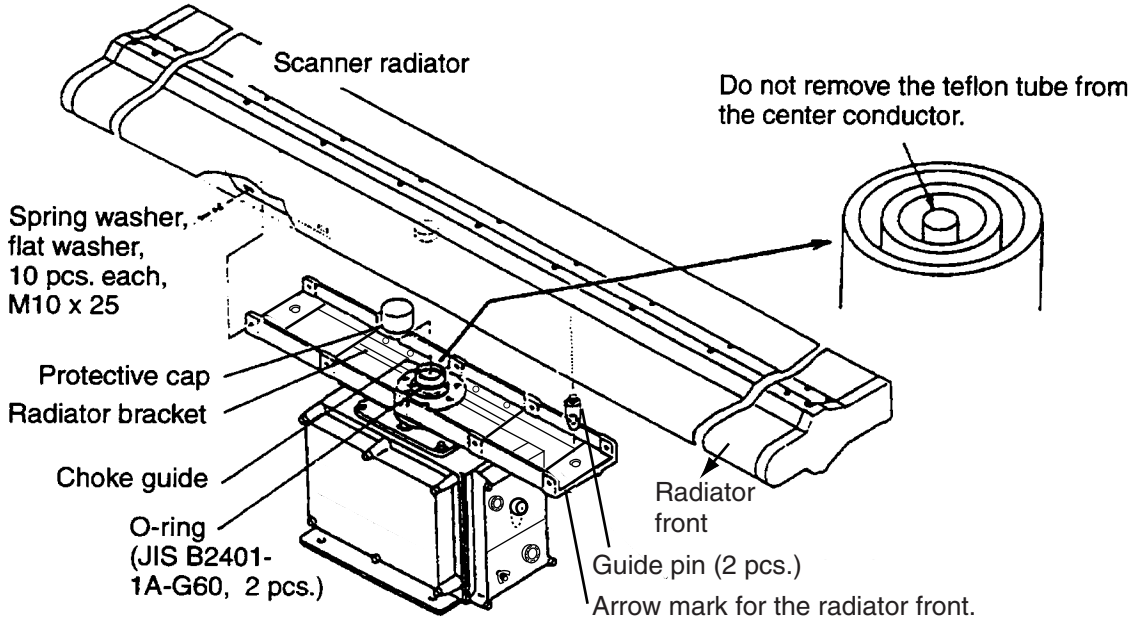

*Mounting precaution for S-band antenna unit*

## Antenna unit assembling

The antenna radiator and the antenna housing are shipped in separate packages. Assemble them as below. The antenna unit may be assembled before hosting it to the mounting platform. However, do not lift the antenna unit by the radiator.

**Antenna unit assembling procedure**

1. Screw the guide pins (2 pcs.) in the radiator.
2. Remove the protective cap from the choke guide and radiator.
3. Grease O-ring and set it to the groove of the choke guide.
4. Place the radiator on the radiator bracket. (Radiator direction is shown by the logo on the bracket. If reversely oriented the radiator cannot be set to the bracket.)
5. Loosely fix the radiator to the radiator bracket with hex bolts (M10X25), spring washers and flat washers.
6. Remove the guides pins and tighten hex bolts.




*Assembling the radiator bracket*

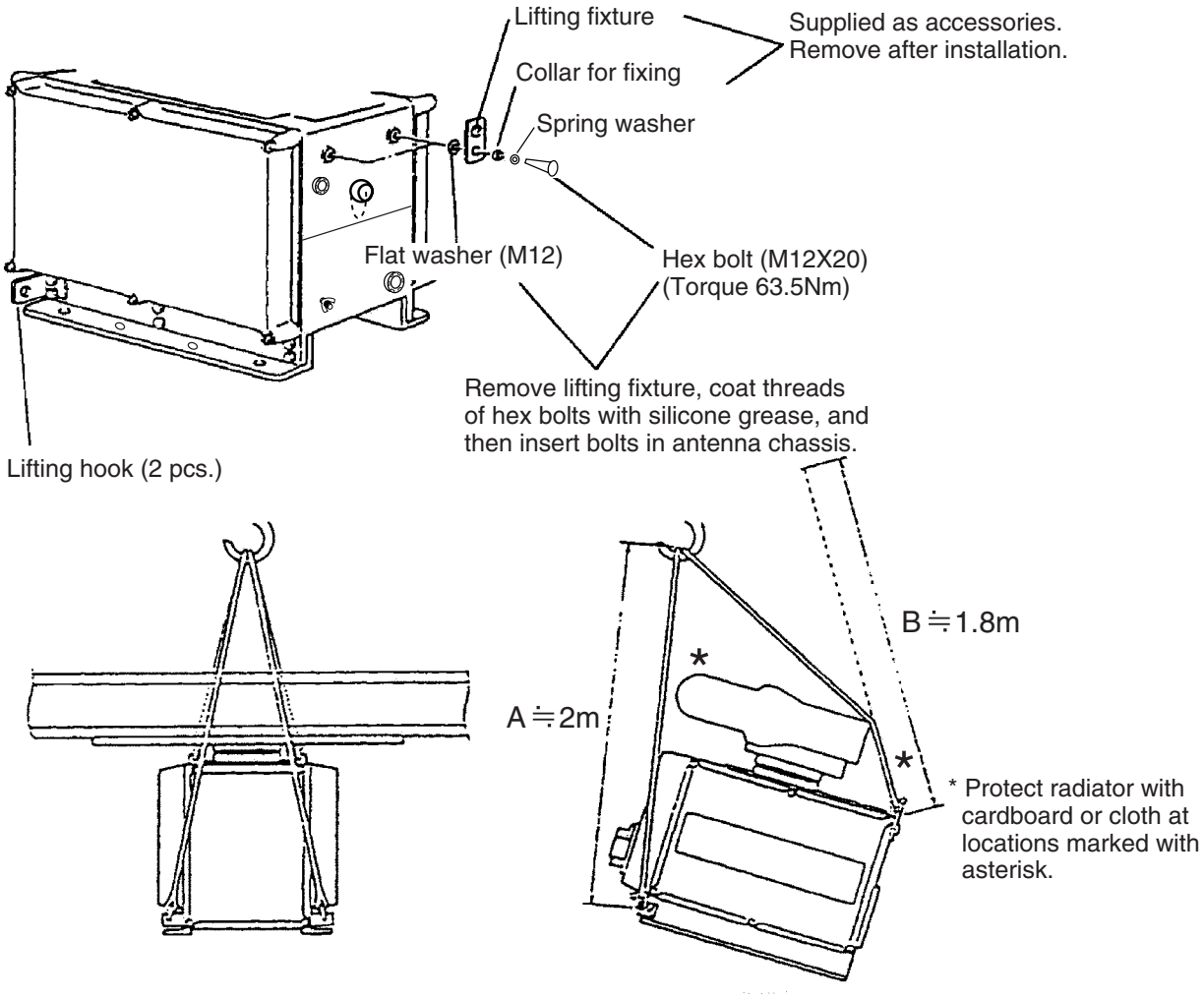
**⚠ CAUTION**

**Be sure to remove the guide pins after fixing the radiator.**

Injury may result if the guide pins loosen and fall.

## How to lift the antenna unit

1. Fix the antenna radiator to the antenna unit chassis as shown on page 1-4.
2. Attach the lifting fixtures and collars as shown below.
3. Position the radiator as shown below and arrange the ropes A and B.

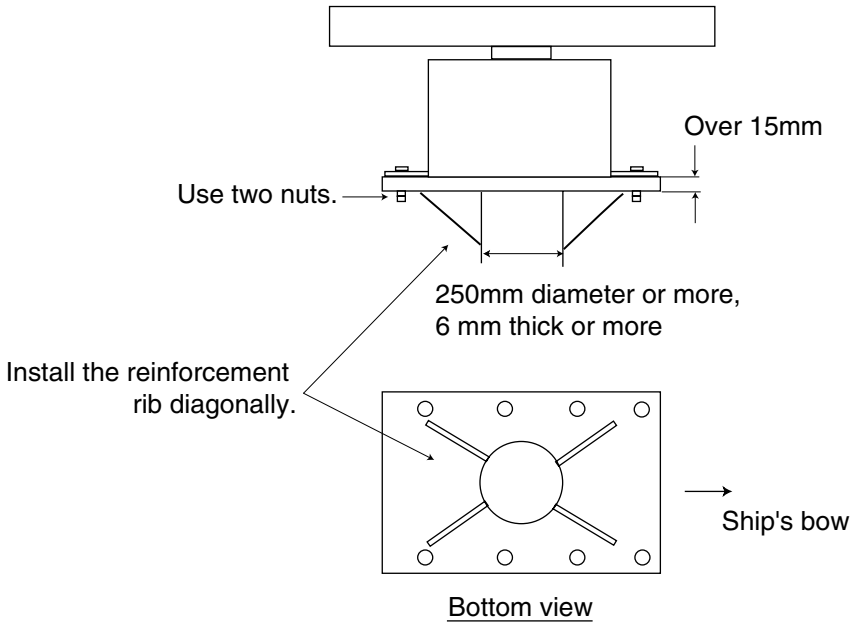



*Attachment of lifting fixtures, collar and ropes*

## Fastening the antenna unit to the mounting platform

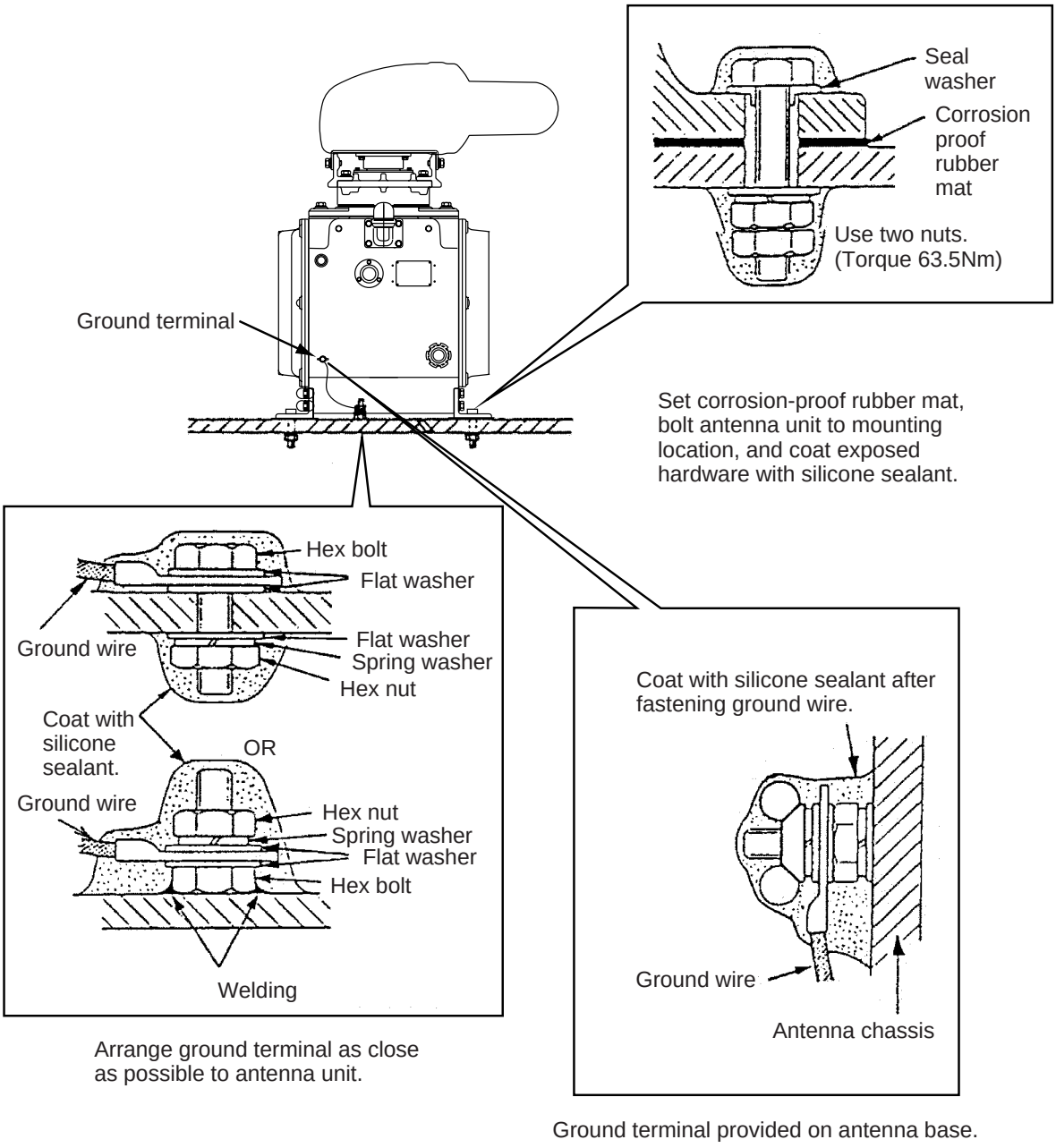
See the figure on the next page for antenna unit mounting.

1. Referring to the antenna outline drawing, drill eight fixing holes of 15 mm in diameter in the radar mast platform or the deck.
   - The diameter of the mast for fixing the antenna unit platform must be over 250 mm.
   - The thickness of the antenna unit platform must be over 15 mm.
   - The reinforcement rib must be installed diagonally as shown below.




*Installation of reinforcement ribs*

2. Place the corrosion-proof rubber mat (supplied) on the mounting platform.
3. Hoist the antenna unit as shown on page 1-3 and place it on the rubber mat. Orient the cable gland toward the ship's stern (or port, starboard). Remove the lifting fixtures and collars.
4. Fix the antenna base to the mounting platform with four M12X70 hex bolts, nuts, washers and seal washers (supplied). For the unit with the performance monitor (PM), orient the PM toward the ship's stern.
5. Arrange the grounding terminal at the nearest grounding spot with the M6X25 hex bolt, nut and washers. Then, fix a ground wire (RW-4747, 340 mm) to the terminal.
6. Connect the other end of the ground wire to the ground terminal of the antenna unit.
7. Coast grounding terminal and fixing bolts on the antenna unit with silicone sealant (supplied).




*Mounting of antenna unit*

# 1.2 Monitor Unit

The monitor unit can be flush mounted in a console panel, or mounted on a desktop using the optional accessories.

**Note:** FAR-2137S-BB has no monitor unit. Prepare a suitable one locally.
Recommended monitor: SXGA (1280x1024), aspect ratio 5:4

## Mounting considerations

When selecting a mounting location, keep in mind the following points:

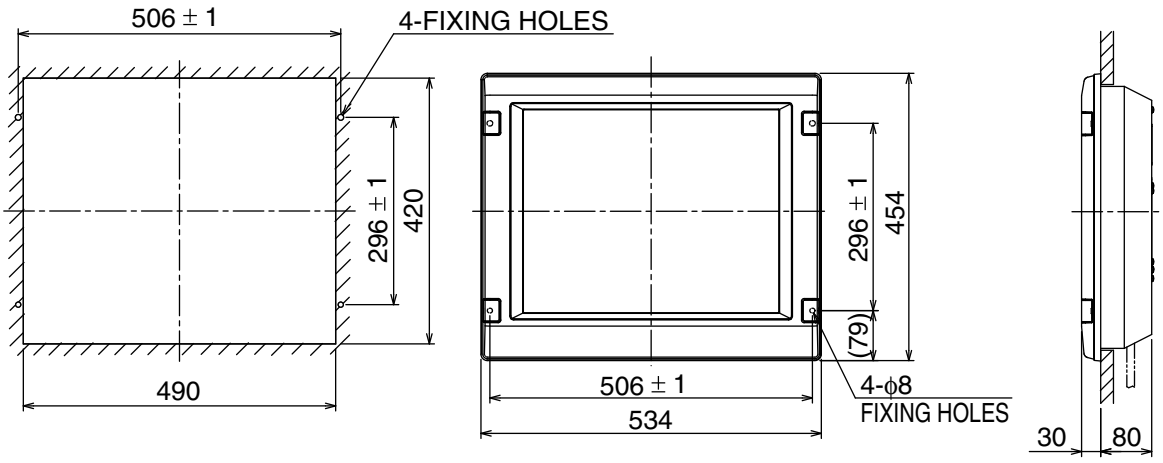
- Select a location where the display unit can be viewed conveniently and where the screen can be viewed while facing towards the bow.
- Locate the unit out of direct sunlight and away from heat sources because of heat that can build up inside the cabinet.
- Locate the equipment away from places subject to water splash and rain.
- Leave sufficient space on the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the monitor unit is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent deviation of a magnetic compass.

## Mounting procedure

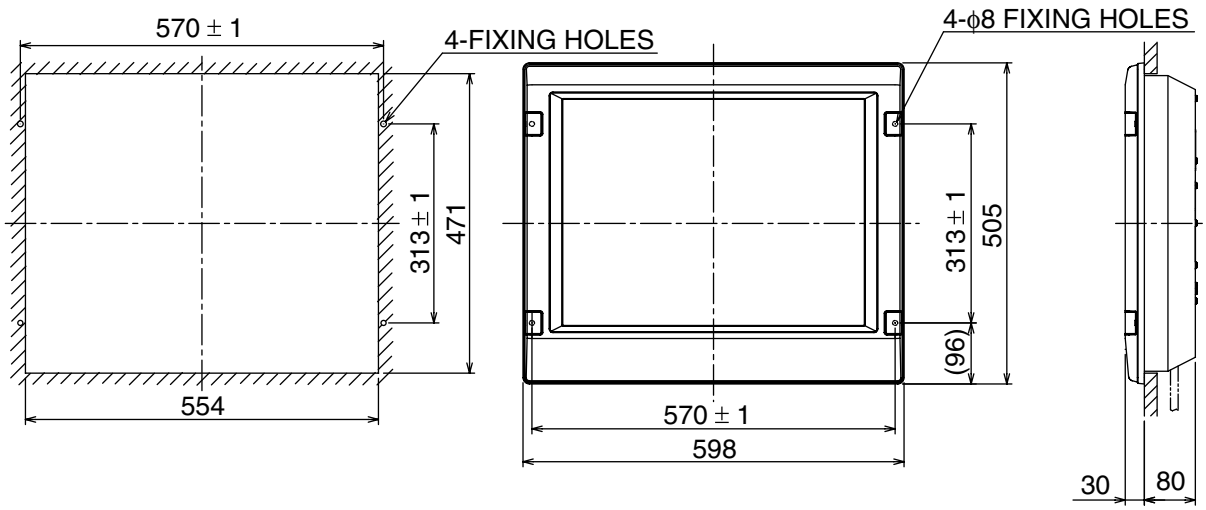
### Flush mounting

Follow the procedure below to mount the monitor unit in a console panel.

1. Make cutout in mounting location referring to the outline drawing shown below.
2. Insert the monitor unit to the hole and fix it by four tapping screws (6x30).
3. Attach panel hooks near the fixing holes (upper two locations). These are used to pull out the monitor unit from a console panel for servicing.
4. Attach four panel covers to the fixing holes.

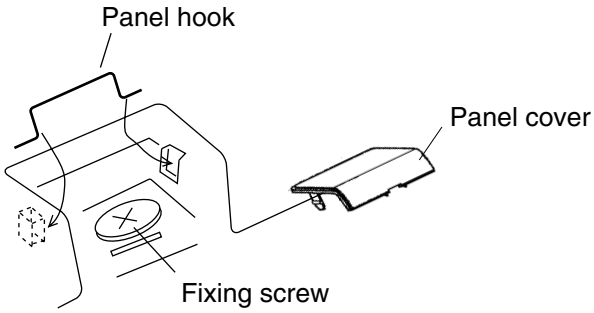



Monitor unit MU-201CR
(For FAR-2137S)




Monitor unit MU-231CR
(For FAR-2837S)

*Flush mounting of monitor unit*




*Attaching panel hook and panel cover*

**Note:** If you need to remove the monitor unit from the mounting panel, remove the four panel covers with your fingernail and use two panel hooks supplied as accessories to lift the monitor unit.

## Desktop mounting

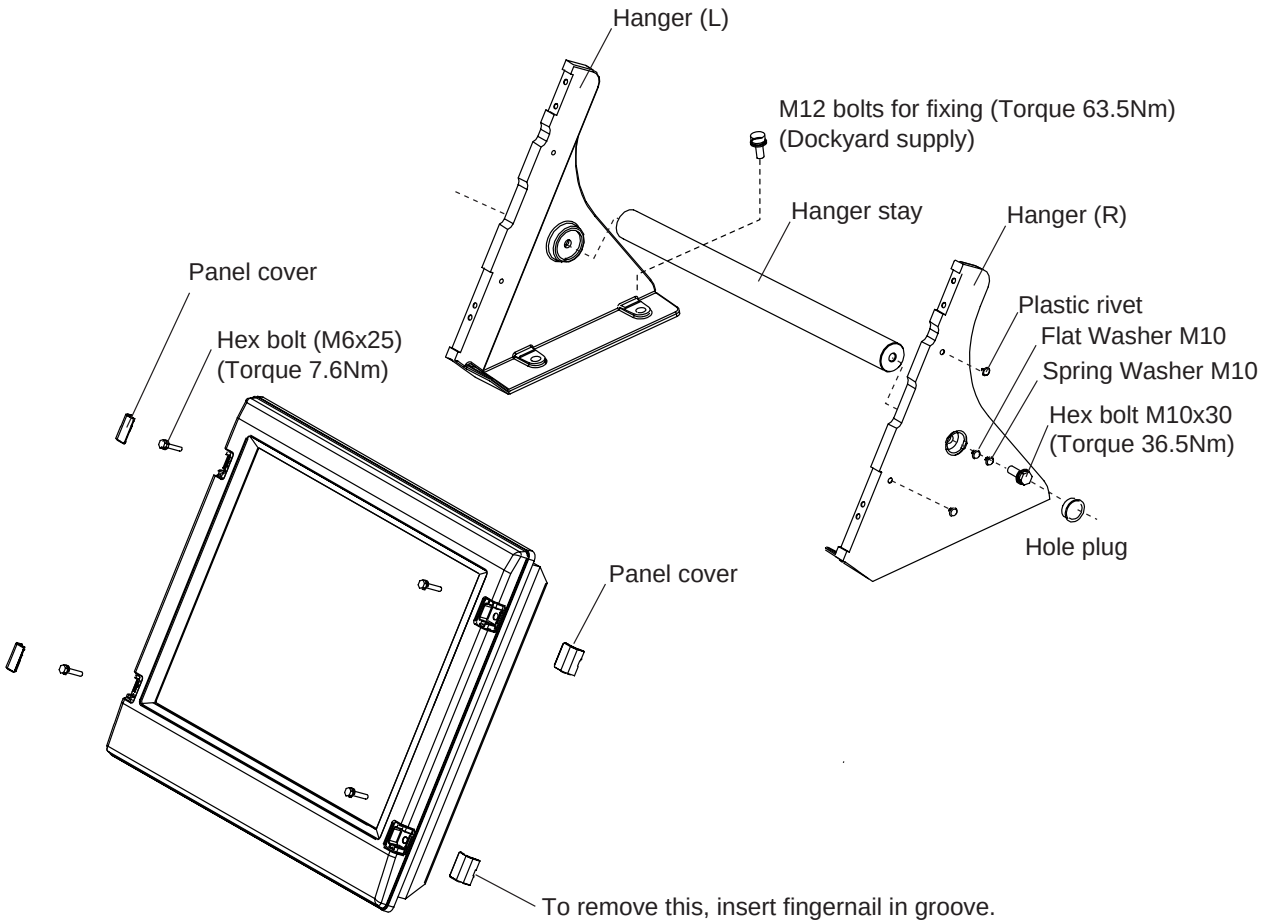
Use the optional accessories to mount the monitor unit on a desktop.

- For FAR-2137S: FP03-09820 (Code No.: 008-535-560)
- For FAR-2837S: FP03-09830 (Code No.: 008-536-020)

*Contents of FP03-09820/09830*

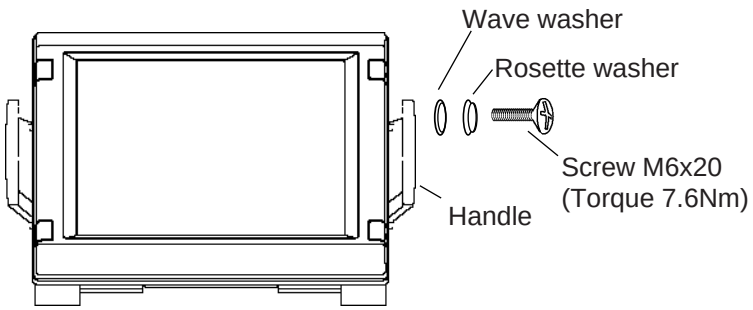
| Name | Type | Code No. | Qty | Remarks |
|---|---|---|---|---|
| Hanger L | 03-163-1111 | 100-305-140 | 1 | |
| Hanger R | 03-163-1112 | 100-305-180 | 1 | |
| Hanger stay | 03-163-1113 | 100-305-190 | 1 | For FAR-2137S |
| | 03-163-2071 | 100-305-370 | | For FAR-2837S |
| Hole plug | CP-30-HP-13 | 000-147-143 | 2 | |
| Plastic rivet | KB-13 Rivet Black | 000-570-276 | 4 | |
| Hex. bolt | M6x25 | 000-802-771 | 4 | |
| Hex. bolt | M10x30 | 000-802-182 | 2 | |
| Spring washer | M10 | 000-864-261 | 2 | |
| Flat washer | M10 | 000-864-131 | 2 | |

1. Assemble two hangers and hanger stay with two hex bolts (M10x30), flat washers and spring washers and cover each hex bolt with hole plug.
2. Fix the above assembly to the mounting location with four hex bolts (M12, dockyard supply).
3. Fasten the monitor unit to the mounting hanger assembly with four hex bolt (M6x25, supplied).
4. Cover each hex bolts with panel cover.
5. Cover each holes for hand grip on the hangers with plastic rivet (4 pcs).




*Monitor Unit*

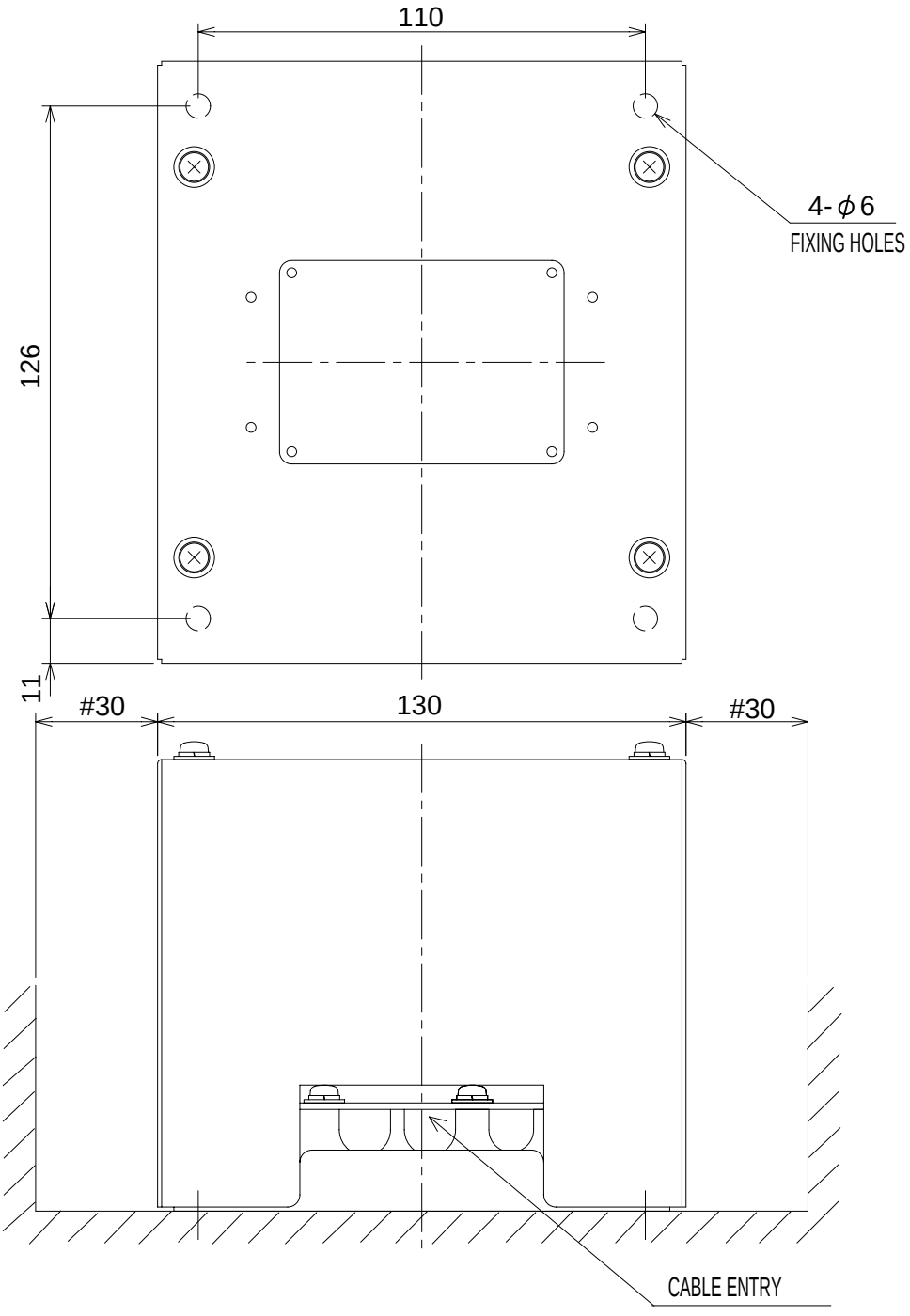
The hand grip is optionally available for the desktop mounting monitor unit.



# 1.3 Power Supply Unit

The Power Supply Unit PSU-007 does not contain usual operating controls. Therefore, it can be installed in any recessed place either in vertical or horizontal position. (For the console mount display unit, the PSU-007 can be installed inside the console.) However, select a dry and well-ventilated location and observe the compass safe distance to prevent deviation of a magnetic compass. See page ii.

1. Open the cover of the power supply unit.
2. Fasten the unit to chosen location with four self-tapping screws 5x20.
3. After connecting cables, attach the cover.



# 1.4 Control Unit

The control unit may be mounted on a tabletop, with or without the KB fixing metal (supplied), which mounts the control unit at an angle.

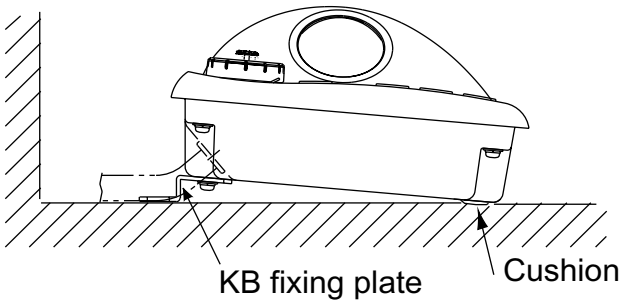
## Mounting considerations

When selecting a mounting location, keep in mind the following points:

- Select a location where the control unit can be operated conveniently.
- Locate the unit away from heat sources because of heat that can build up inside the cabinet.
- Locate the equipment away from places subject to water splash and rain.
- Determine the mounting location considering the length of the signal cable between the control unit and the processor unit. (The signal cable comes in lengths of 10 m).
- A magnetic compass will be affected if the control unit is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent deviation of a magnetic compass.

### Fixing with KB fixing plate

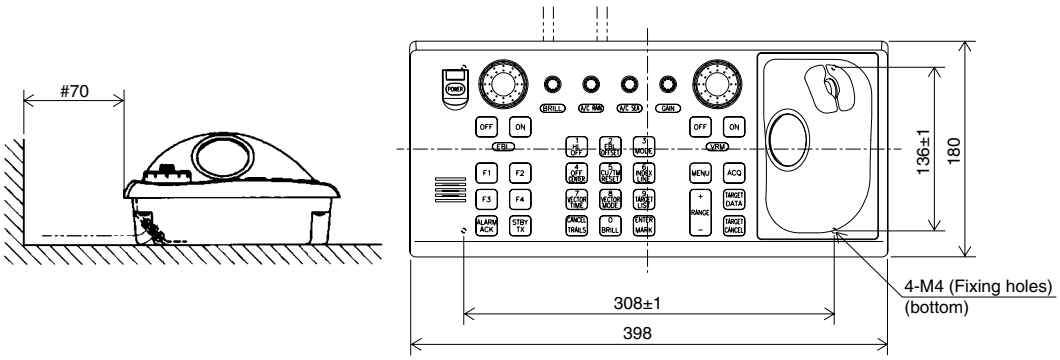
1. Fix the KB fixing plate to the bottom of the control unit.
2. Attach cushions (three for RCU-014, two for RCU-015/016) to the bottom of the control unit as shown below.
3. Fix it to a desired location with self-tapping screws (local supply).



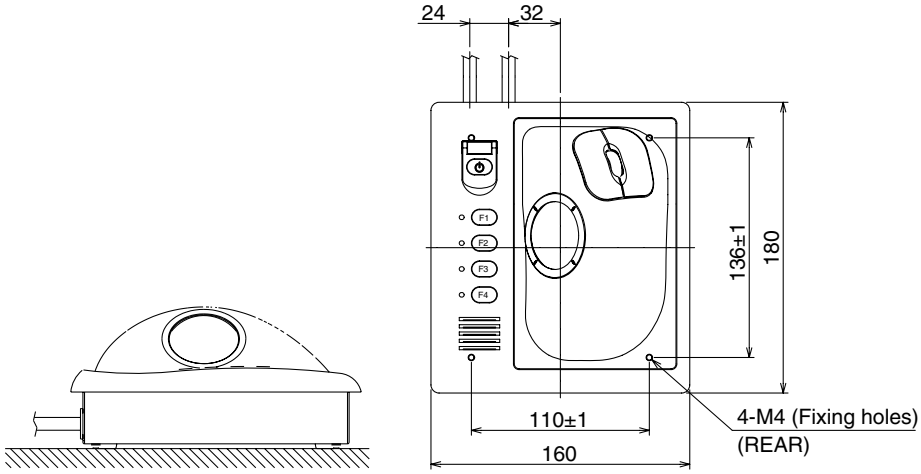

*Side view for RCU-014/015/016*

**Fixing without KB fixing metal**

1. Drill four mounting holes of 5 mm diameter referring to the outline drawing at the back of this manual.
2. Fix the control unit with four screws (M4) from under side of the tabletop. (The M4 screws with a sufficient length for the thickness of the tabletop should be provided locally.)




*Control Unit RCU-014*




*RCU-015/016*

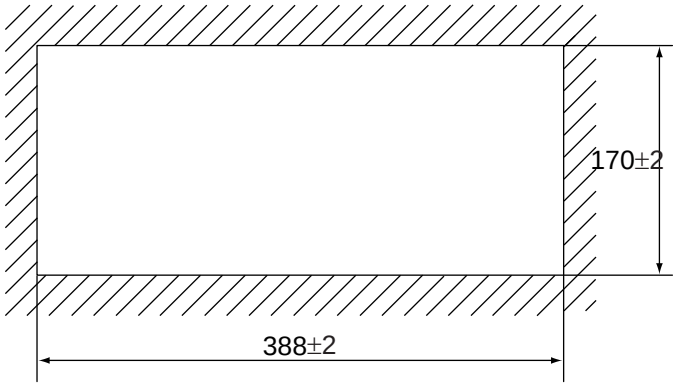
**Flush mounting**

Use the optional flush mount kit FP03-09870 to mount the control unit RCU-014, RCU-015 and/or RCU016 to a console panel.

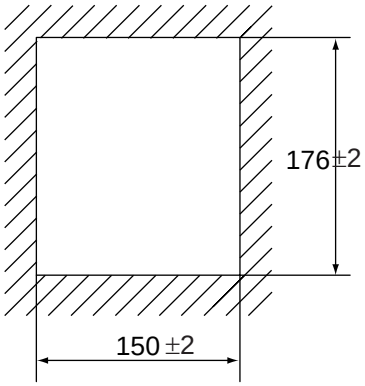
Name: Flush mount kit
Type: FP03-09870
Code No.: 008-535-630

| No. | Name | Type | Qty |
|---|---|---|---|
| 1 | Mount plate | 03-163-7531 | 4 |
| 2 | Hex bolt | M4 | 4 |
| 3 | Wing screw | M4X30 | 4 |

1. Prepare a cutout in the mounting location as shown in the figure below.

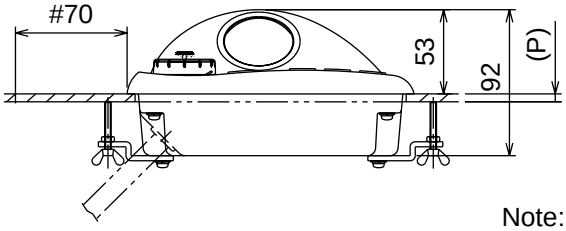



*For RCU-014*



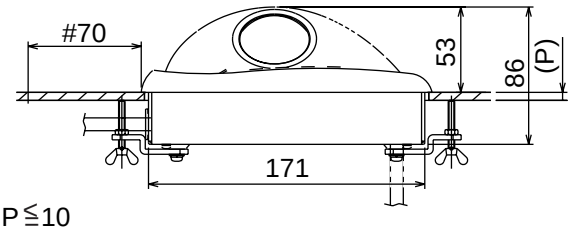

*For RCU-015 and RCU-016*

2. Set the control unit to the cutout.
3. Attach the mounting plate to the control unit with four screws from the rear side.
4. Screw the wing screw to each mounting plate and then insert hex bolt to each wing screw.
5. Fasten each wing screws and then fasten the hex nuts as shown in the figure below.




Note: P≦10

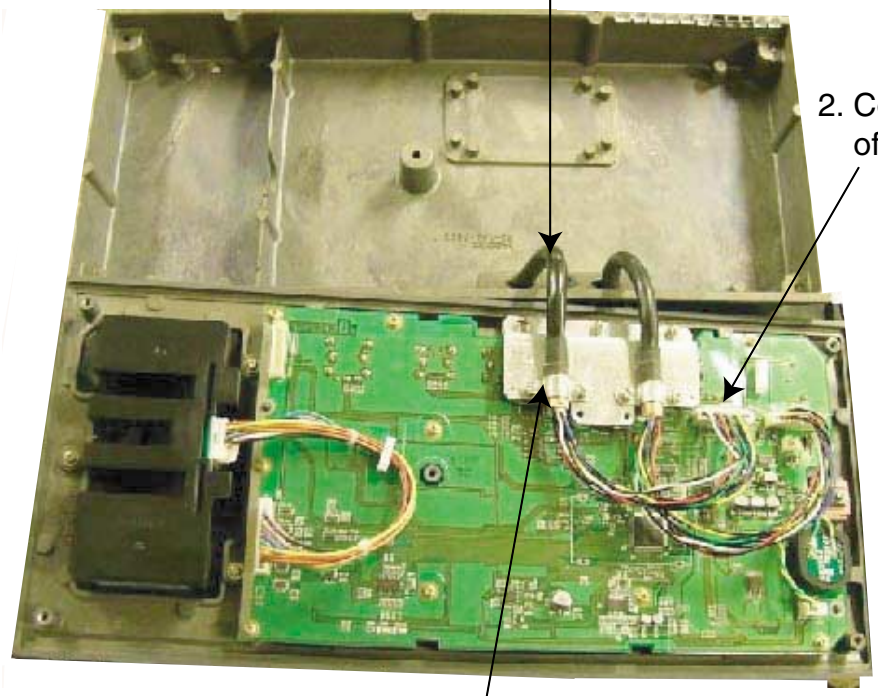
*RCU-014*




*RCU-015/RCU-016*

**To connect RCU-016 in series with RCU-014**

1. Pass the cable derived from RCU-016.



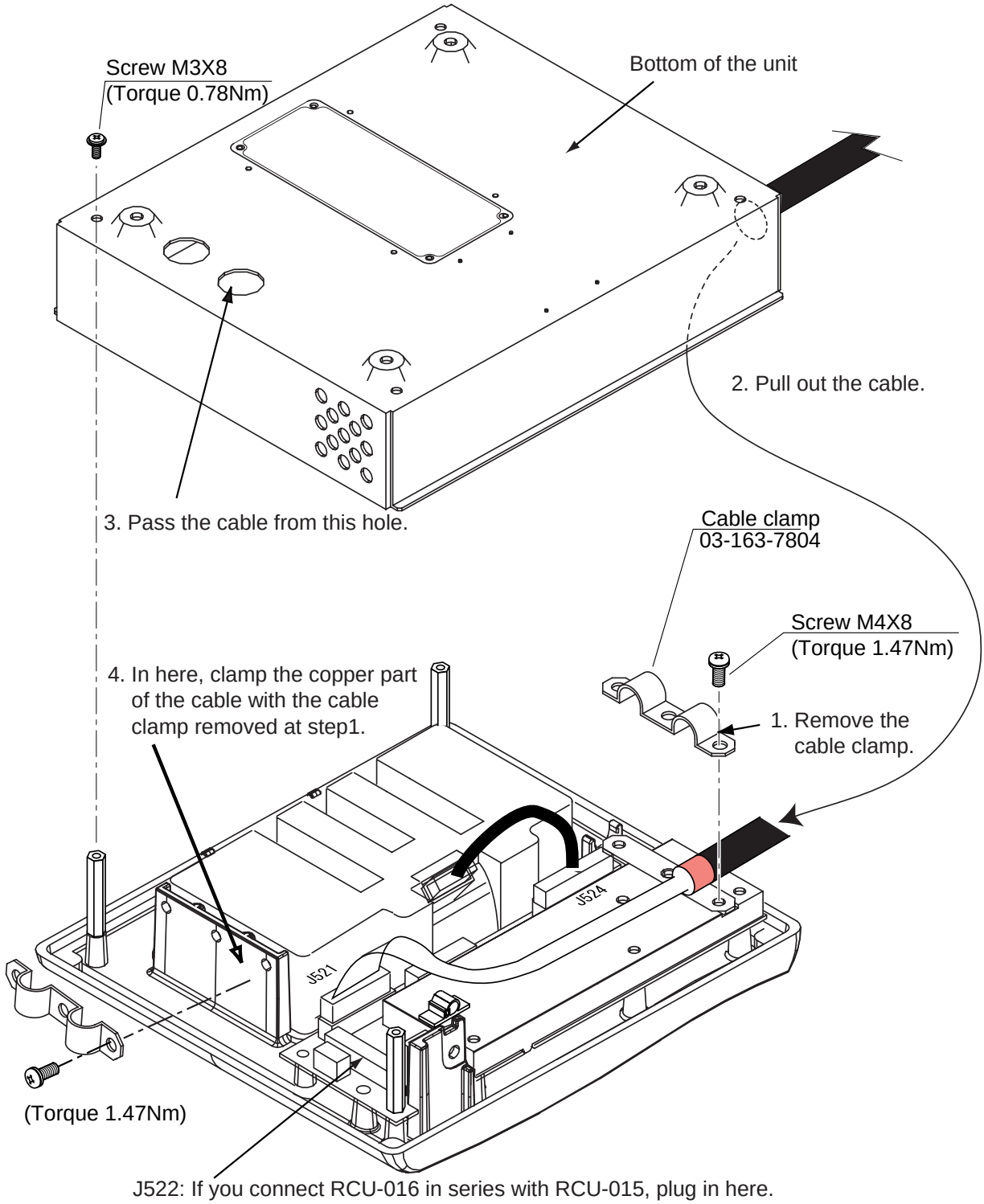
2. Connect the connector of the cable to J502.

3. Clamp the copper part of the cable with the cable clamp.

*Inside of RCU-014*

## To change the cable entry

To change the cable entry from the side (default) to the bottom, modify the unit as shown below.




*RCU-015/016: Changing cable entry*

# 1.5 Processor Unit

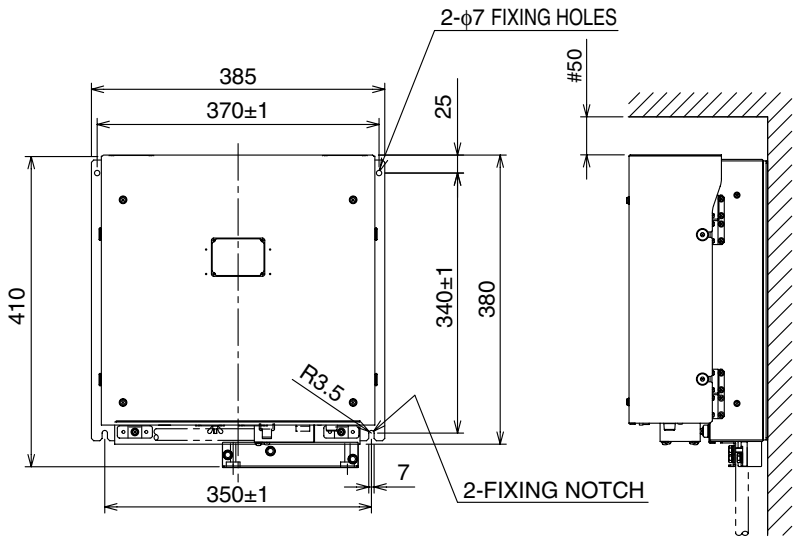
## Mounting considerations

When selecting a mounting location, keep in mind the following points:

- Locate the processor unit away from heat sources because of heat that can build up inside the cabinet.
- Locate the equipment away from places subject to water splash and rain.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the processor unit is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent deviation of a magnetic compass.

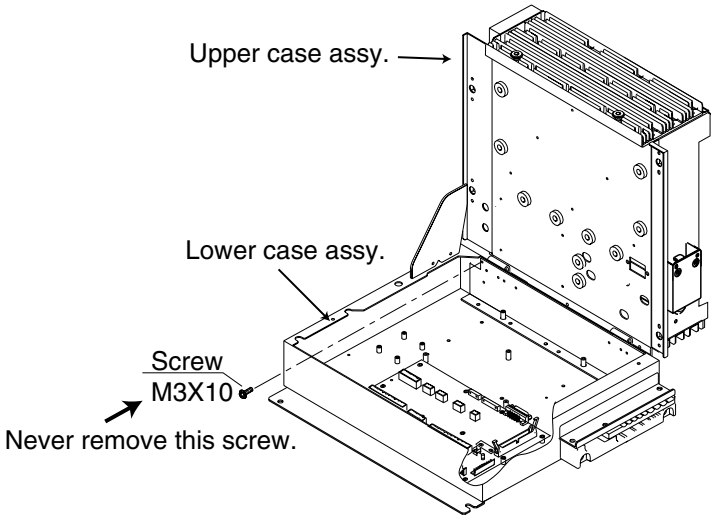
## Mounting procedure

1. Fix the unit with four M6 bolts, or self- tapping screws.




*Floor mounting or bulkhead mounting*

**Note:** If you fix the unit, cable entry upside, never remove the screw M3x10 that joints the upper case assy. and lower case assy. of the processor unit.

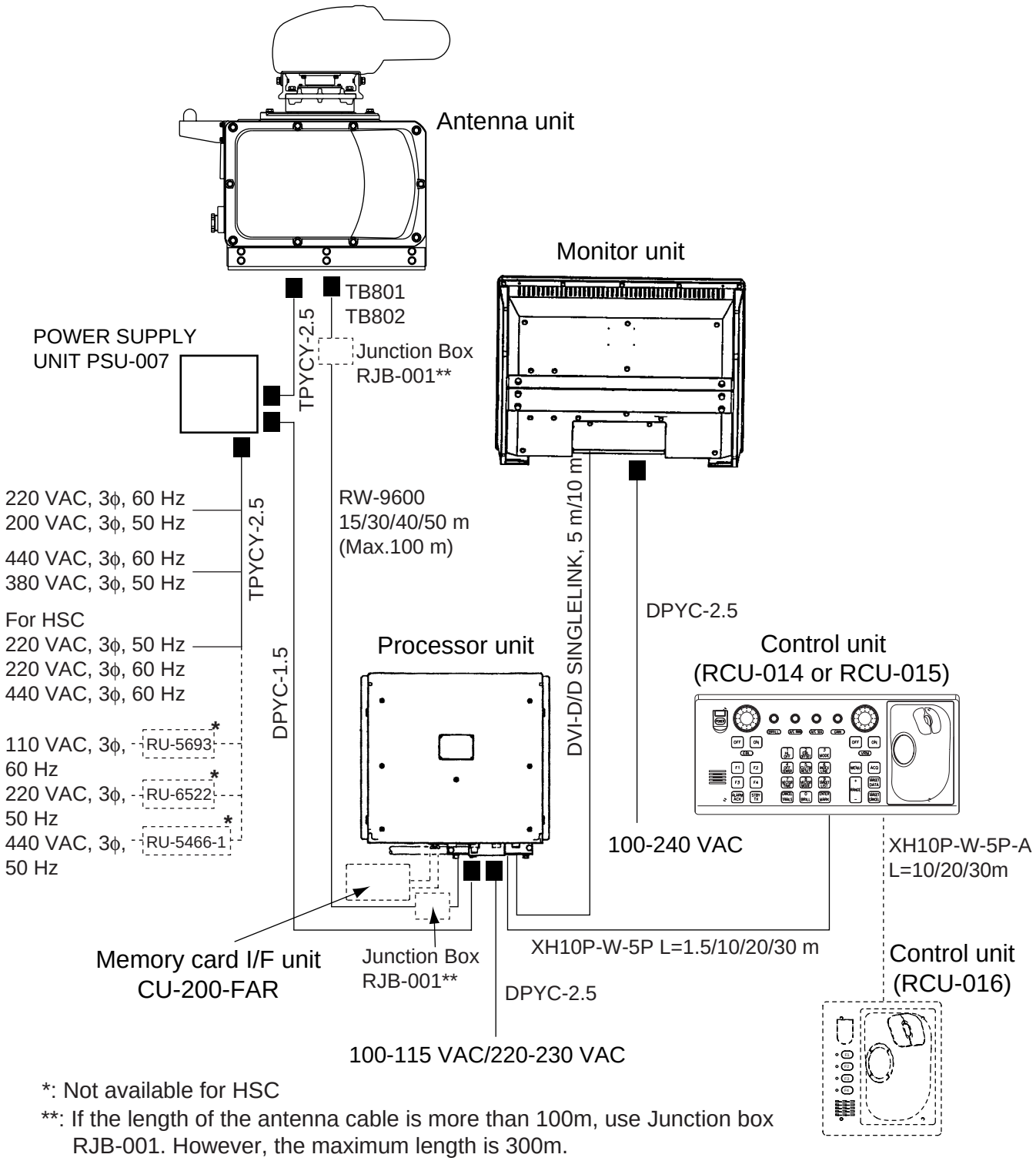



*Processor unit*

This page is intentionally left blank.

# 2. WIRING

## 2.1 Interconnection



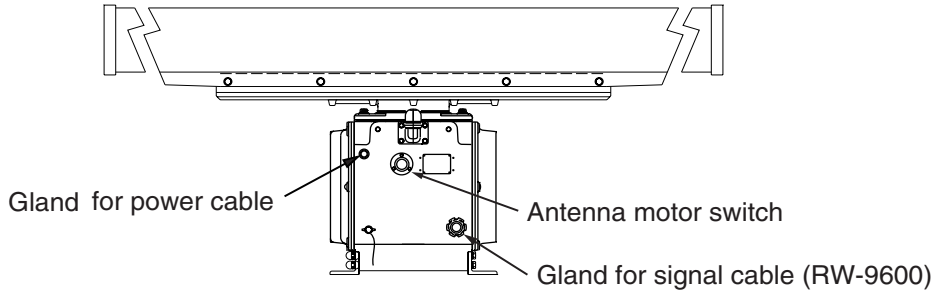

*: Not available for HSC

**: If the length of the antenna cable is more than 100m, use Junction box RJB-001. However, the maximum length is 300m.

■ : Cable requires fabrication

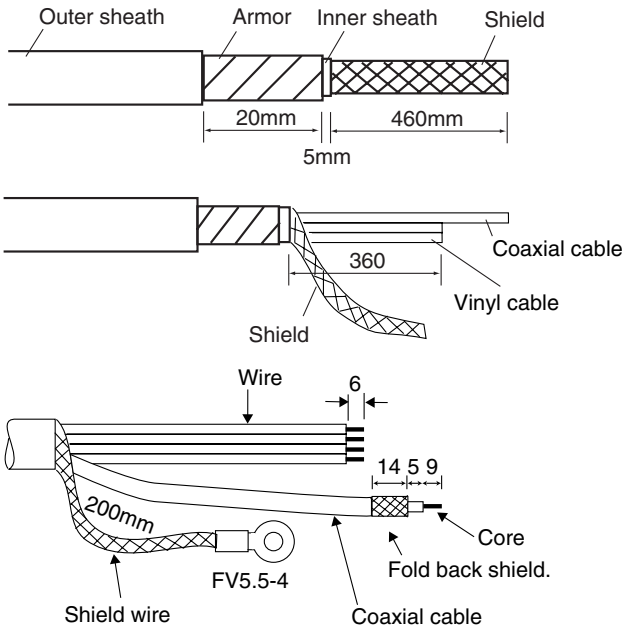
*Standard Interconnection*

# 2.2 Antenna Unit

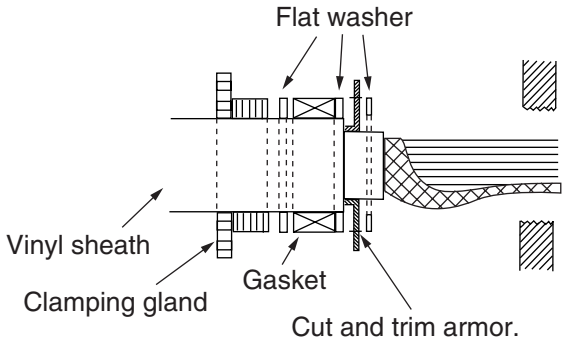



*Antenna unit, bow view*

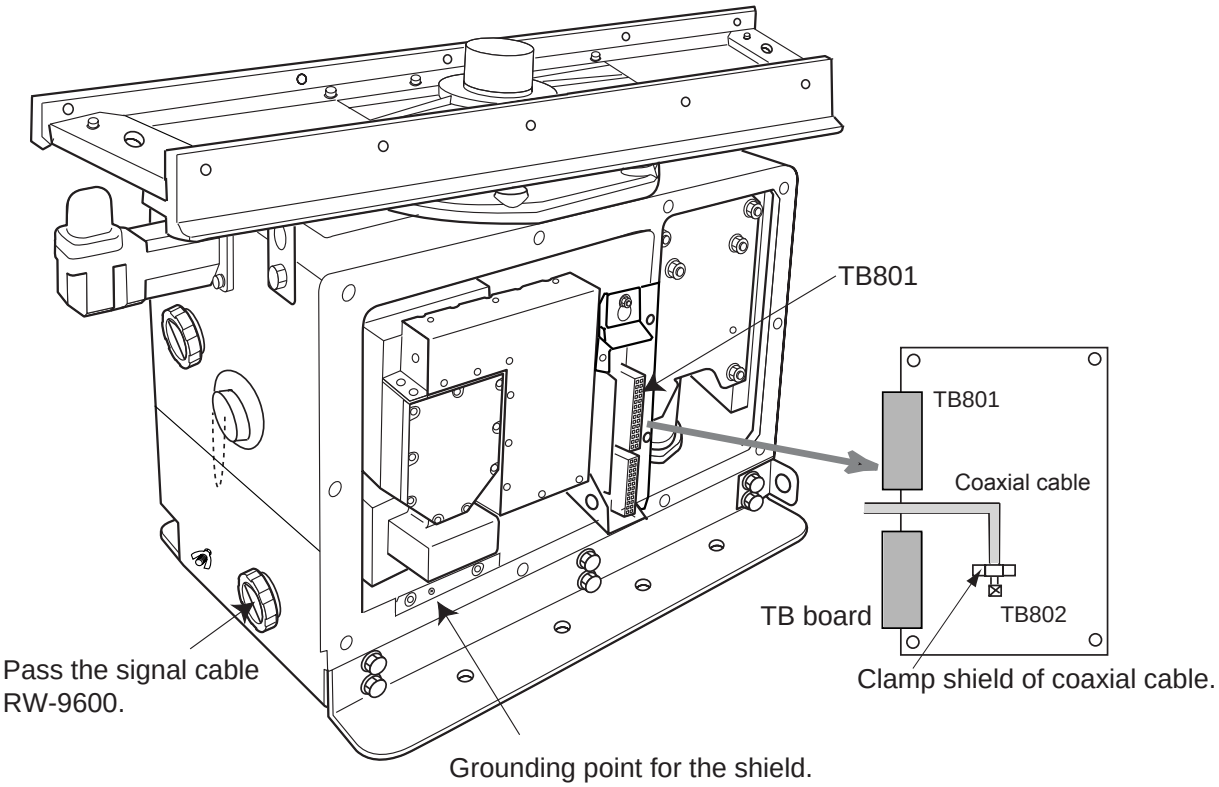
1. Open the right side cover on the antenna unit with the hex wrench.
2. Unfasten the cable gland for the signal cable and remove the gasket, flat washers and blind lid.
3. Fabricate the signal cable RW-9600 as follows.
   a) Remove the outer sheath, armor and inner sheath as shown right.
   b) Unravel the shield to expose the wires in the inner layer.
   c) Shorten each core considering its location on the terminal board TB801.
   d) Trim each wire (except coaxial wire) considering its location on the terminal board.
   e) Trim the shield leaving 200 mm and attach crimp-on lug FV5.5-4.
   f) Remove insulation of each wire by about 6 mm.
   g) Fabricate the coaxial cable as shown right.




4. As shown in the figure below, slide the clamping gland, flat washer, gasket and flat washer on the signal cable.
5. Fold back armor and pass the flat washer as shown in the figure below. Cut and trim the armor around the flat washer.

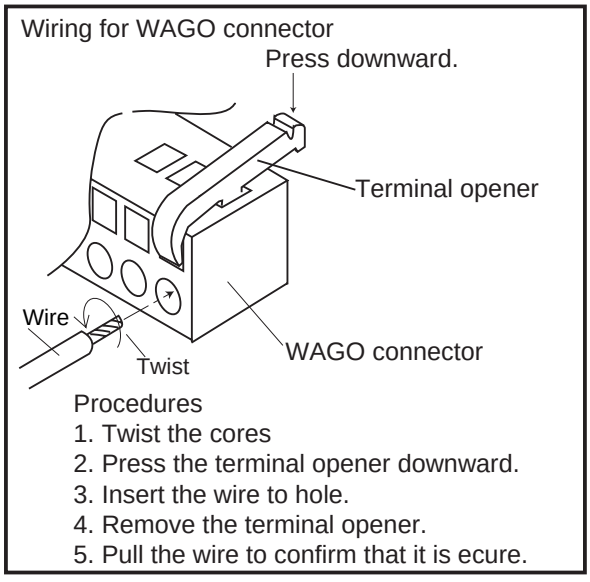



*Passing clamping gland, washers and gasket on the signal cable*




*Antenna unit, port side view*

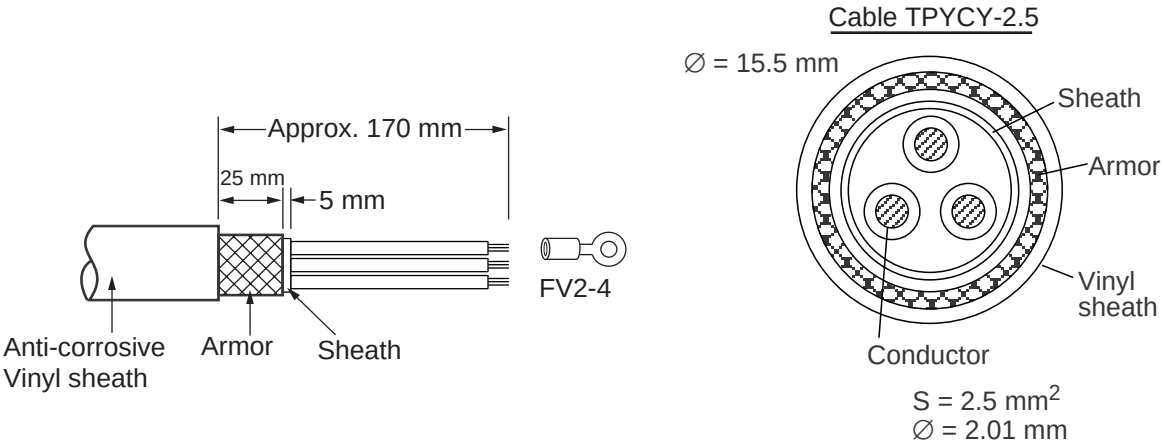
6. Confirm that armor is grounded between two flat washers.
7. Coat the screw part of the clamping gland with silicone sealant and tighten it.
8. Using the opener, insert each core (except coaxial cable) to appropriate connector plug on the TB801.




9. Loosen two screws and slide the TB board assembly upward and pull out it.
10. Connect the coaxial cable to TB802 on the TB board and clamp the shield with the cable clamp on the TB board.
11. Remount the TB board assembly.
12. Connect the shield wire to the grounding point as shown in the figure above.
13. Seal the cable gland with putty.

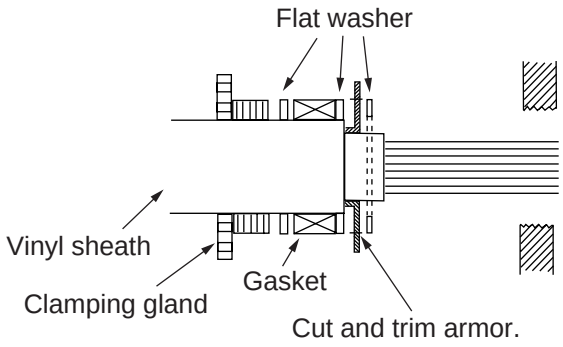
## Fabricating power cable TPYCY-2.5

1. Open the left side cover on the antenna unit with the hex wrench.
2. Fabricate the cable as shown below. Use TPYCY-2.5 (Japan Industry Standard) cable or equivalent.



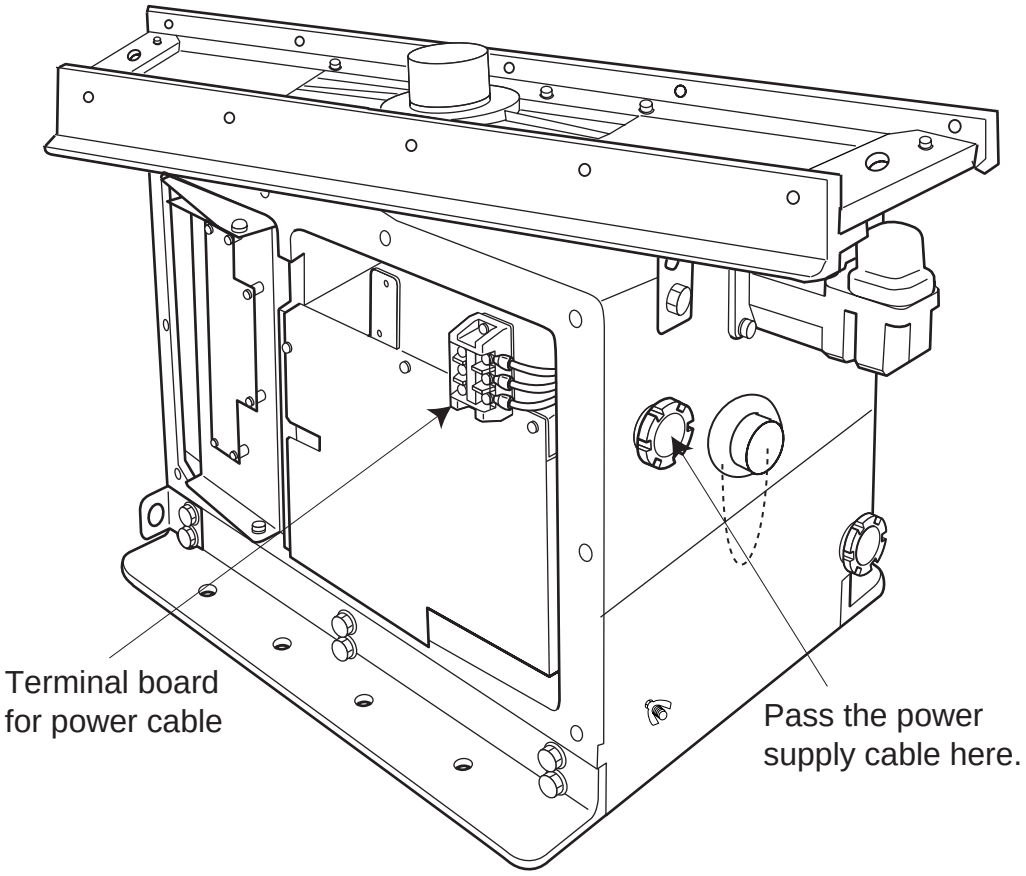

*Fabricating the power cable TPYCY-2.5*

3. At the power cable gland on the antenna unit, unfasten the clamping gland and remove gasket, flat washers and blind lid.
4. As shown in the figure below, slide the clamping gland, washers and gasket onto the power cable. Fold back the armor by 5 mm, and then pass it through the two flat washers.




*Passing clamping gland, washers and gasket on power cable TPYCY-2.5*

5. Coat the screw part of the clamping gland with silicone sealant and tighten it.
6. Pass the power cable behind the terminal block, and then pass it through the locking wire saddle.
7. Fix the crimp-on-lug FV2-4 (blue) to each conductor.




*Antenna unit, left view*

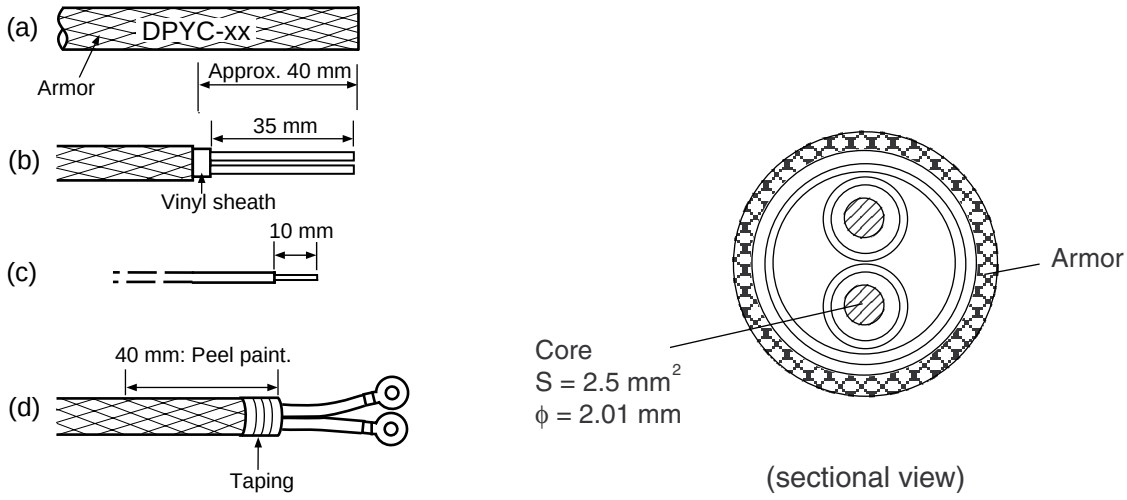
8. Connect crimp-lug to the terminal block referring to the interconnection diagram.
9. Attach the cover.
10. Seal the cable gland with putty.

# 2.3 Monitor Unit

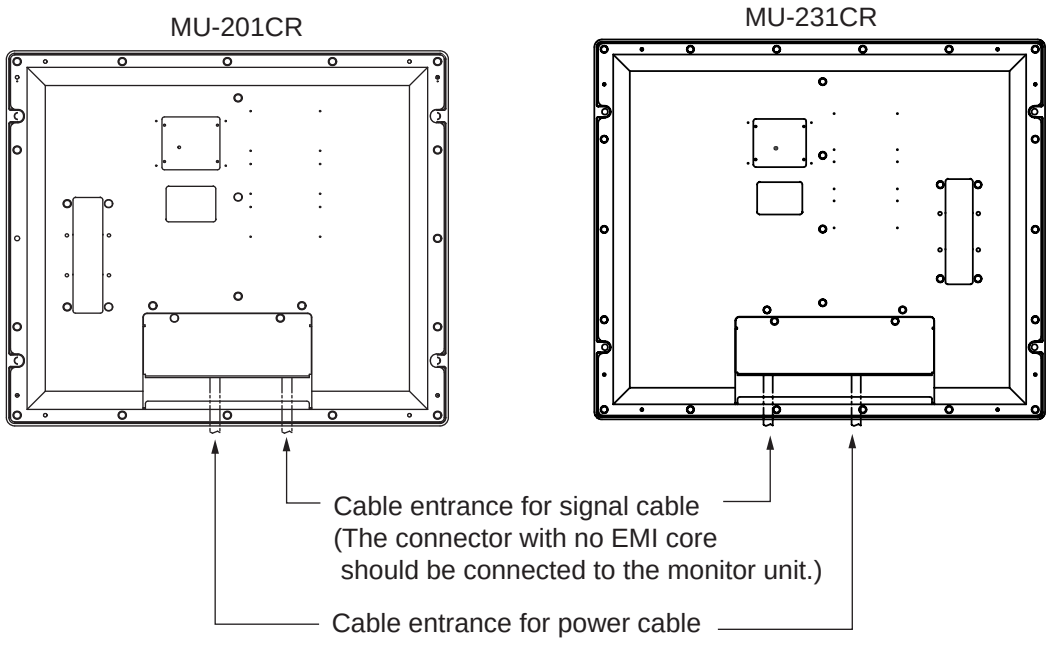
Two cables are terminated at the display unit: the signal cable from the processor unit (5 m or 10 m cable) and the power cable from the ship's mains. The signal cable comes with a connector preattached to it for connection to the display unit. Fabricate the power cable as below. Use DPYC-2.5 (Japan Industry Standard) cable or the equivalent.

## Fabricating the power cable

1. Cut armor of the cable by 40 mm.
2. Cut vinyl sheath by 35 mm.
3. Remove insulation of wires by about 10 mm. Fix crimp-on lugs to the cores.
4. Peel paint of the armor by 40 mm.
5. Cover the end of armor with vinyl tape.




*Fabricating power cable DPYC-2.5*




*Monitor unit (rear panel)*

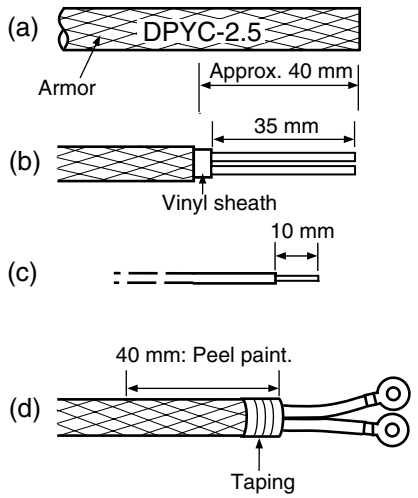
# 2.4 Processor Unit

Four cables are terminated at the processor unit: the antenna unit cable, display unit cable, control unit cable and the power cable. Cables other than the power cable come with a connector preattached to them for connection to the processor unit. Fabricate the power cable as below. For the power cable, use DPYC-2.5 (Japan Industry Standard) or the equivalent.

Note: If one line of AC is grounded, connect it to “C” (common) terminal and the other line to “H” (hot).
Pass the AC line through a double-contact breaker (shipyard supply).

## Fabricating the power cable

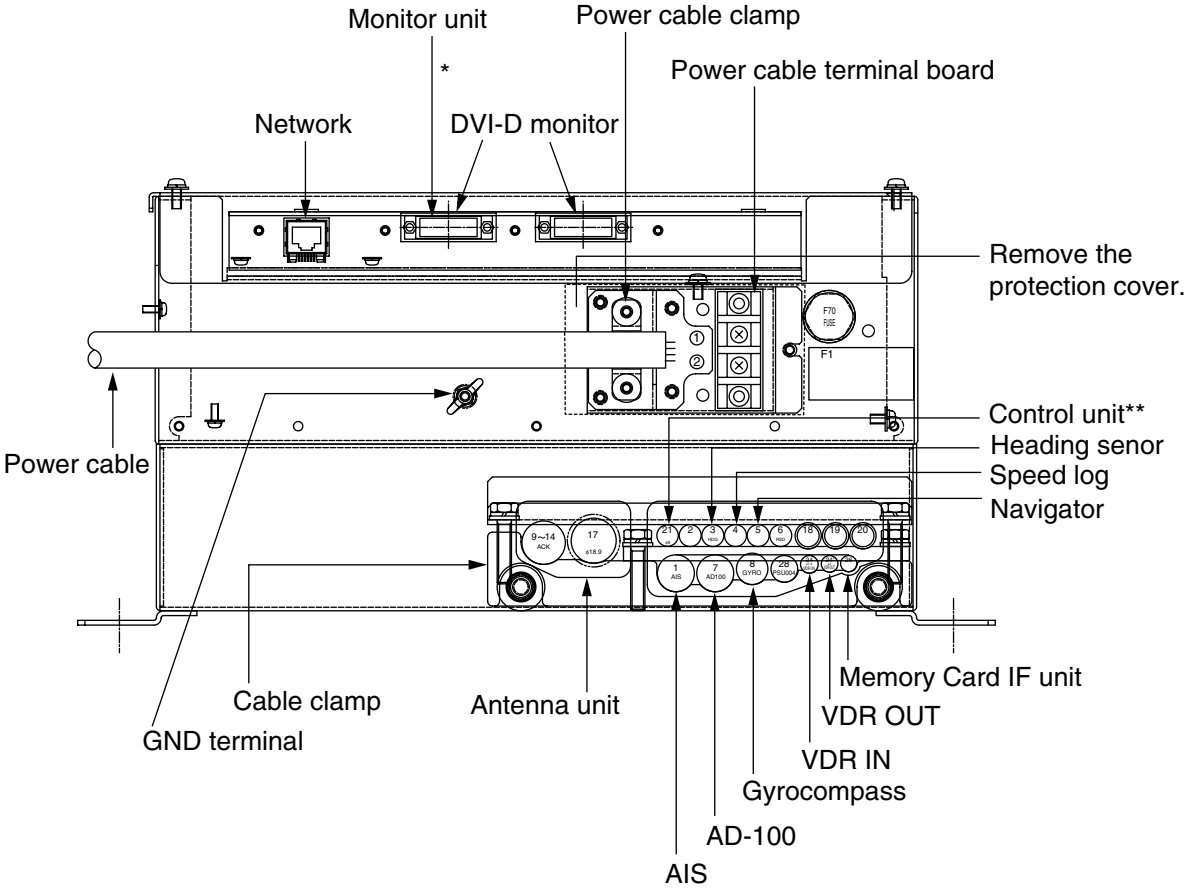
1. Cut armor of the cable by 40 mm.
2. Cut vinyl sheath by 35 mm.
3. Remove insulation of wires by about 10 mm. Fix crimp-on lugs to the cores.
4. Peel paint of the armor by 40 mm.
5. Cover the end of armor with vinyl tape.




*Fabricating power cable DPYC*

## Connection of cables

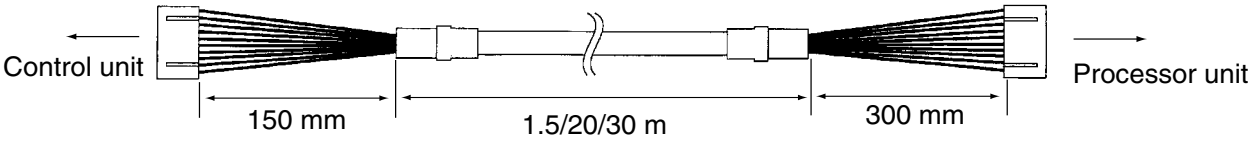
The power cable is connected to the terminal board on the rear panel and the signal cable from the Monitor unit is connected to the DVI-D connector. Other cables are connected to the printed circuit board 03P9342.




*Processor unit*

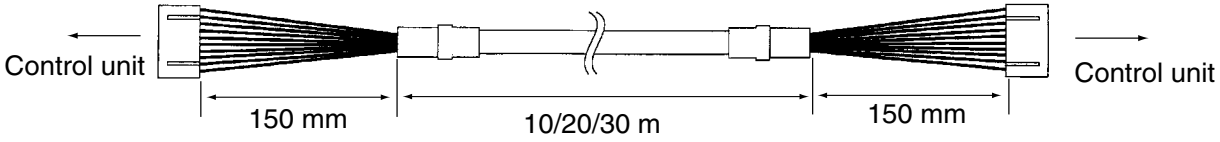
*: The connector side which EMI core is attached should be connected to the processor unit.

**: The configuration of optional cables between the processor unit and the control unit is as follows. Note that the cable fabrication for each end is different.




*Cable XH10P-W-5P L=20/30M*

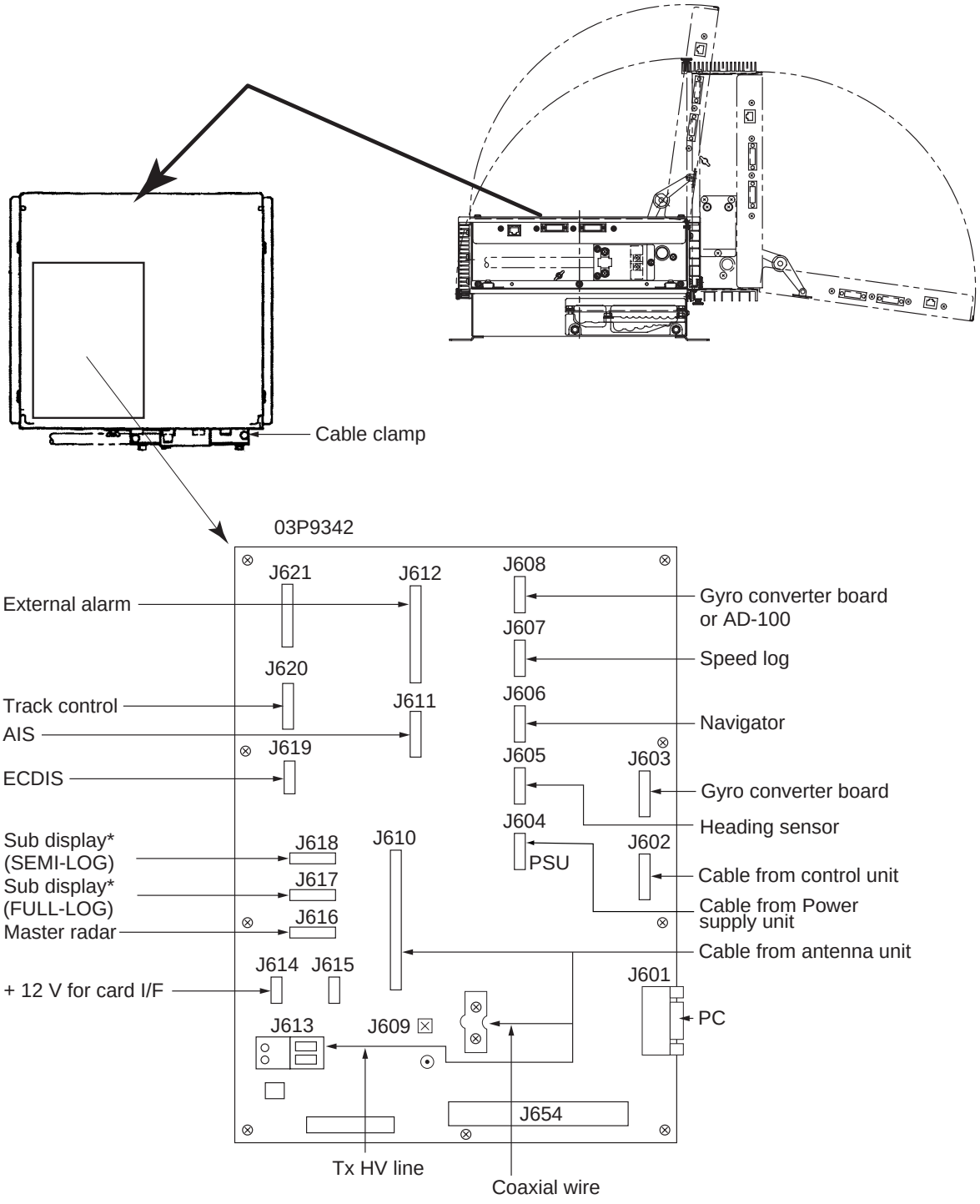
When the RCU-016 is installed, optional cable (XH10P-W-5P-A, L=10/20/30M) is required. Cable fabrication for each end is the same.




*XH10P-W-5P-A L=10/20/30M*

## Location of connectors

Open the processor unit as follows and the 03P9342 board appears.

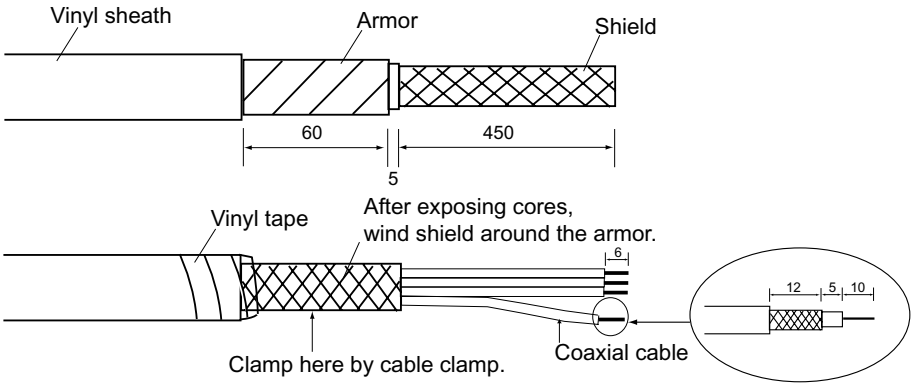



*03P9342*

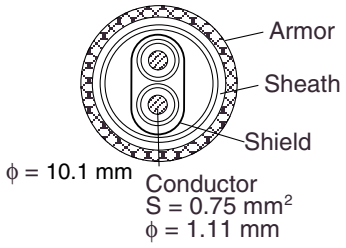
*: See page 2-11 for details.

## Cable fabrication for the cables connected to the 03P9342 board

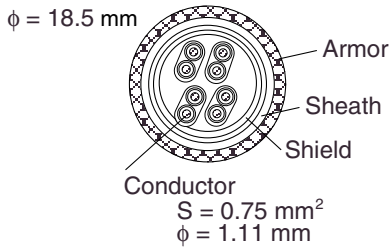
- Signal cable RW-9600 (Between antenna unit and processor unit)



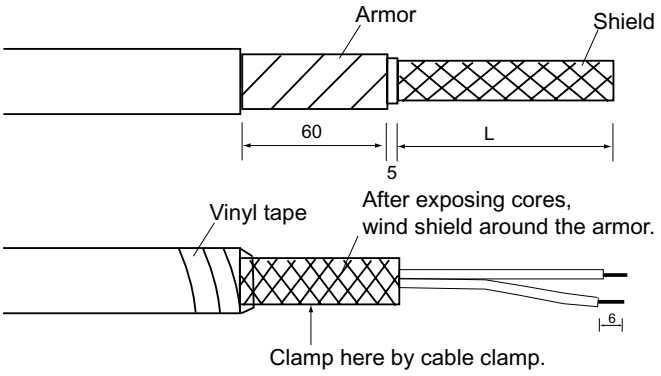

- Other cables for optional units
  Use TTYCS-1 or TTYCS-4 (Japan standard cable) or equivalent.



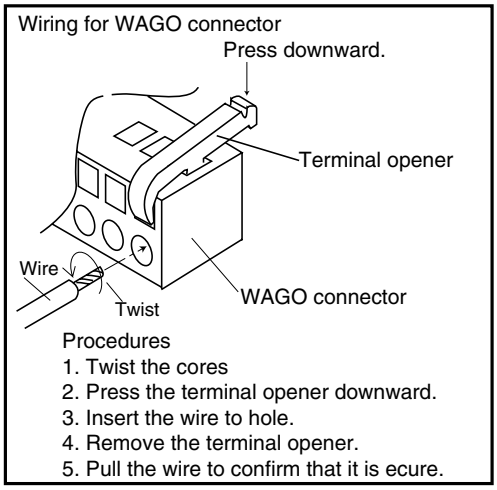

TTYCS-1




TTYCS-4




L= Depends on equipment connected. Measure at the processor unit.



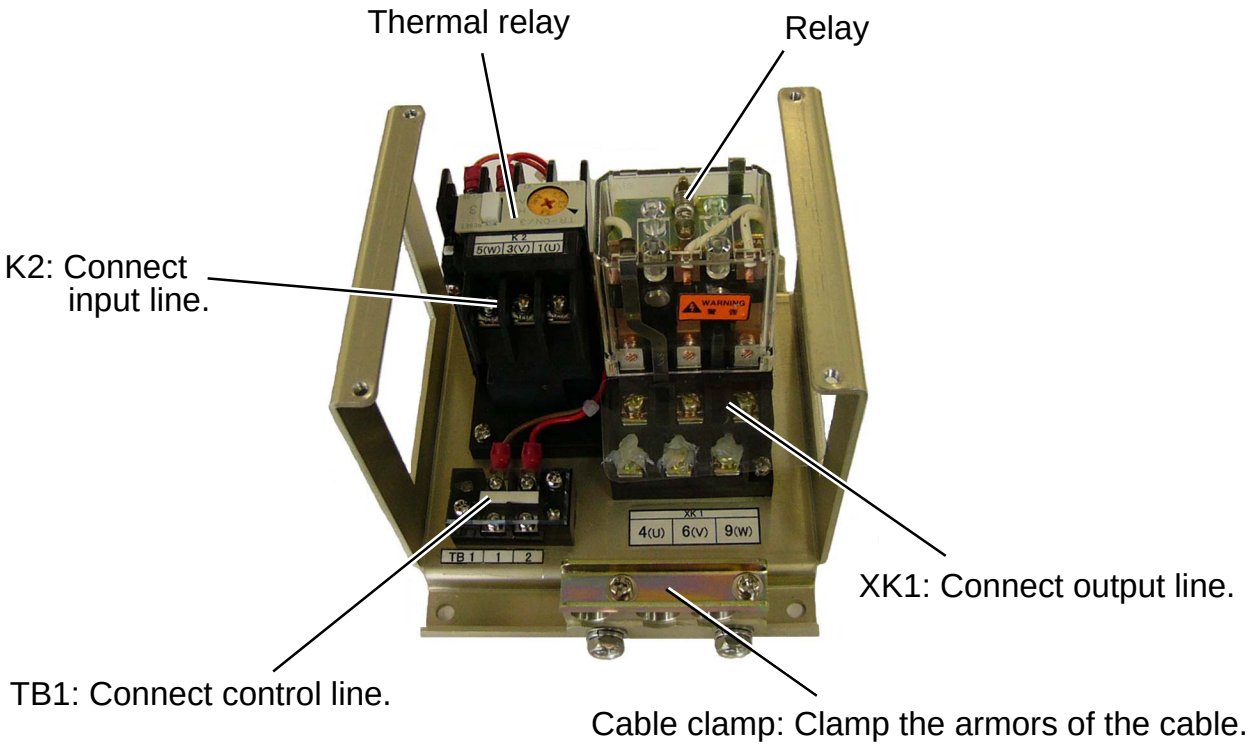
## Connection of Sub-display

A conventional remote display and/or FAR-2107 series radar can be connected to J617 and J618 in the processor unit as a sub-display. However, the control for GAIN and STC are different depending on J617 and J618. Refer to the table to connect sub-displays.

| Port | | Conventional remote display | FAR-2107 series radar |
|---|---|---|---|
| J617<br>(FULL-LOG) | Overall gain | Even if input video level is adjusted to 4 Vp-p, the gain is 8 db lower than that on the master radar. | The gain is 8 dB lower than that on the master radar. |
| | GAIN control | The GAIN control is effective. | The GAIN control has no effect. |
| | STC control | The STC control is effective. | The STC control has no effect. |
| J618<br>(SEMI-LOG) | Overall gain | When input video level is adjusted to 4 Vp-p, the gain becomes the same as that on the master radar. | The gain is almost same as that on the master radar. |
| | GAIN control | The GAIN control is effective. | The GAIN control has no effect. |
| | STC control | The STC control is effective, however this control is added on the signal adjusted by the master radar. So this port is not recommended to use . | The STC control has no effect. |

## 2.5 Power Supply Unit

Wire the unit as shown in the interconnection diagram.

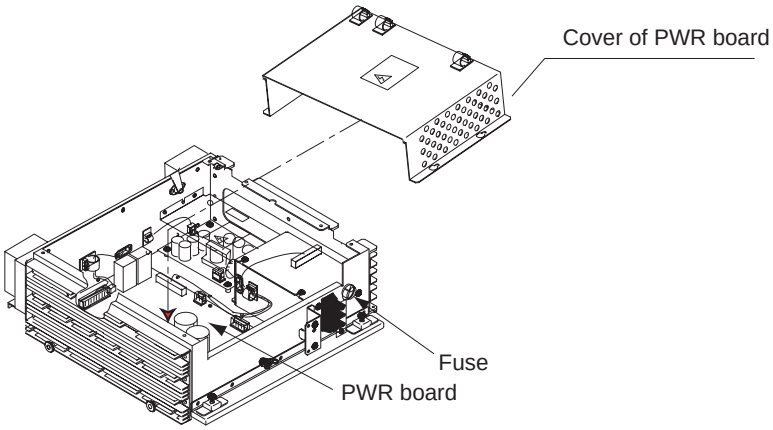



*Power supply unit PSU-007*

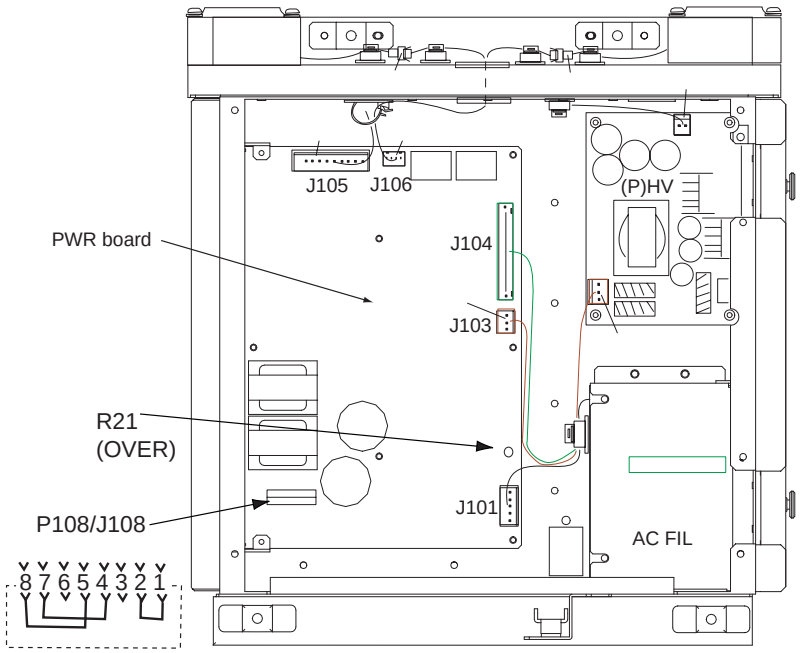
## 2.6 Changing AC Power Specification of Processor Unit

To change AC power specification between 100 VAC and 220 VAC, add or remove jumper connector P108 on the PWR board 03P9339 and change the fuse on the processor unit according to ship's mains as shown in the table below. The figure on the next page shows the location of the fuse and the jumper connector on the PWR board. Also, adjustment of the overvoltage detection circuit is required.
Note: To change from 220VAC to 100VAC, locally prepare the jumper connector, referring to the figure on the next page (VH10P connector housing is fitted at J108).

| Power supply | Fuse | Jumper connector P108 |
|---|---|---|
| 100 VAC | 10A | Added |
| 220 VAC | 5A | Removed |




Upper part of processor unit
(SPU assembly omitted)




Jumper connector
(VH10P)

**How to adjust the overvoltage detection circuit:**

1. Add or remove the jumper connector P108 and change the fuse.
2. Rotate R21 fully clockwise on the PWR board.
3. Connect a variable transformer between ship's mains and the input power terminal board TB-1 of the processor unit.
4. Adjust the variable transformer output (i.e., input voltage to the processor unit) as follows.
   For 100 VAC set: 144 VAC
   For 220 VAC set: 288 VAC
5. Turn on the radar and rotate the R21 counterclockwise gradually until the overvoltage detection circuit functions (i.e., power supply cuts off).
6. Lower the output voltage of the variable transformer and confirm that the radar automatically turn on with a voltage lower than 142VAC or 284VAC.
7. Gradually increase the output voltage of the variable transformer and confirm that the overvoltage detection circuit functions at 144V or 288VAC of the variable transformer output.
8. Assemble and connect the processor unit.

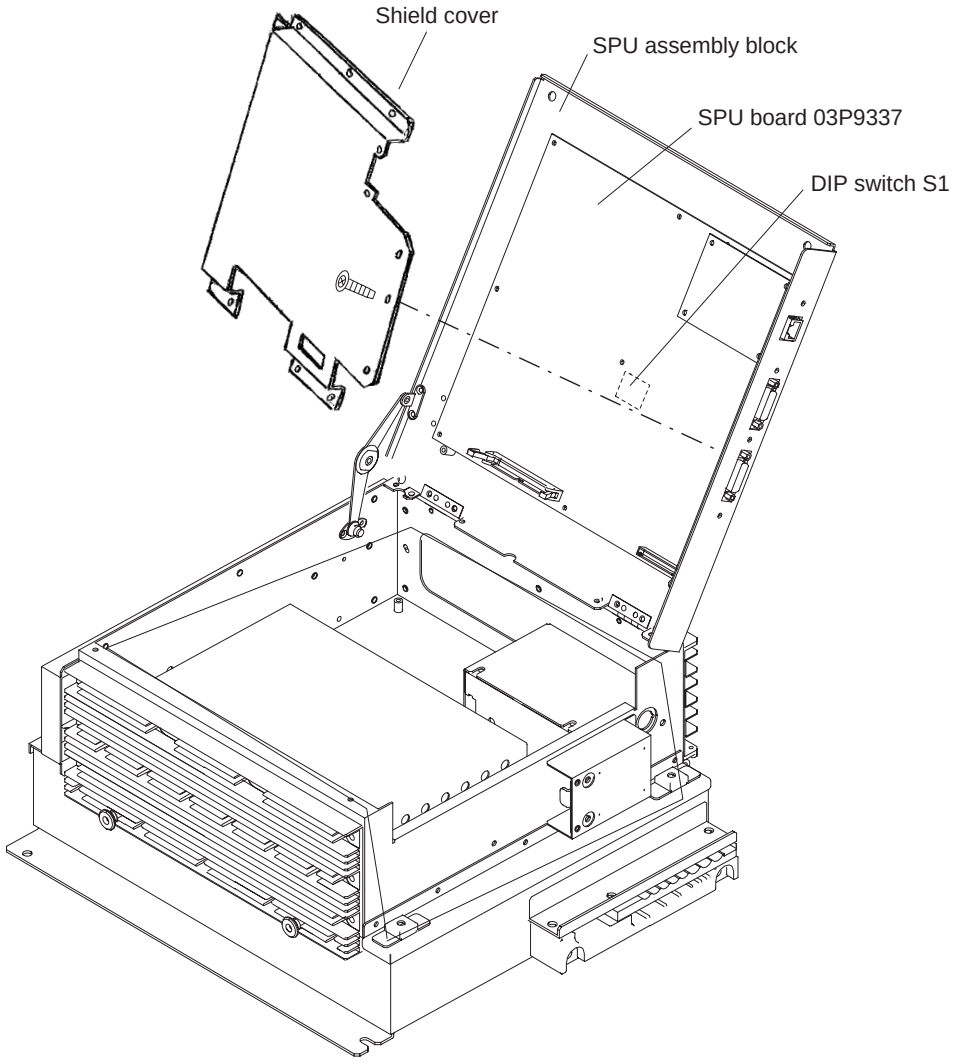
This page is intentionally left blank.

# 3. SETTING AND ADJUSTMENT

## 3.1 DIP Switch Setting

The processor unit is shipped for model FAR-2137S. If your model is FAR-2837S/2137S-BB, change the DIP switch setting as follows.

1. Remove the top cover of the processor unit.
2. Open the SPU assembly block and remove the shield cover.

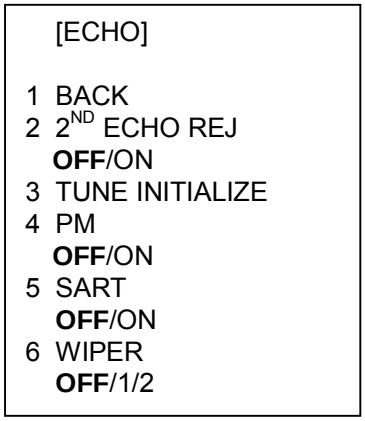



3. Set the DIP switch S1 as follows. See errata sheet at end of this manual.

| | Monitor SXGA for FAR-2137S (Default) | Monitor UXGA for FAR2837S | FAR-2137S-BB |
|---|---|---|---|
| 1 | OFF | | OFF |
| 2 | OFF | OFF | ON |
| 3 | Not used. | | |
| 4 | | | |

# 3.2 Initializing tuning

1. Transmit the radar on 48 nm range and rotate the GAIN knob to show 70-80 of the gain bar.
2. Roll the trackball to choose the MENU box at the right side of the screen and then push the left button.
3. Roll the wheel to choose 1 ECHO and then push the wheel.




Bold: Default settings
(Same for all menu illustrations)

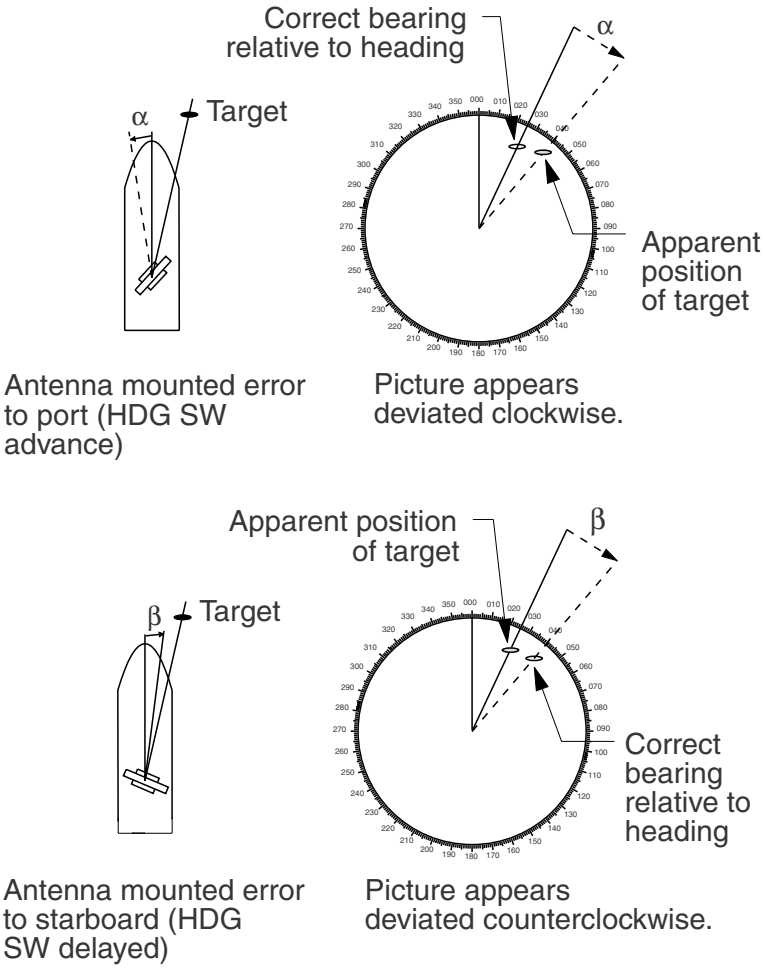
*ECHO menu*

4. Roll the wheel to choose 3 TUNE INITIALIZE.
5. Push the wheel to initialize automatic tuning.
   After a while, echoes appear on the screen. The message “TUNE INITIALIZE” appears in red during automatic tuning. When this message disappears, the tuning is completed. If necessary adjust the GAIN to show echoes clearly.
6. Push the right button twice to close the menu.

# 3.3 Heading Alignment

You have mounted the antenna unit facing straight ahead in the direction of the bow. Therefore, a small but conspicuous target dead ahead visually should appear on the heading line (zero degrees).

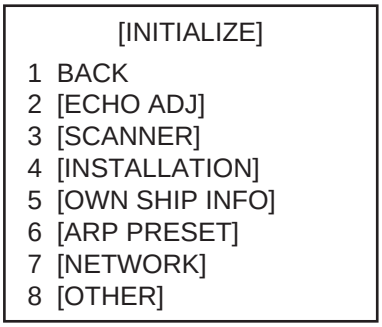
In practice, you will probably observe some small bearing error on the display because of the difficulty in achieving accurate initial positioning of the antenna unit. The following adjustment will compensate for this error.




*Heading alignment*

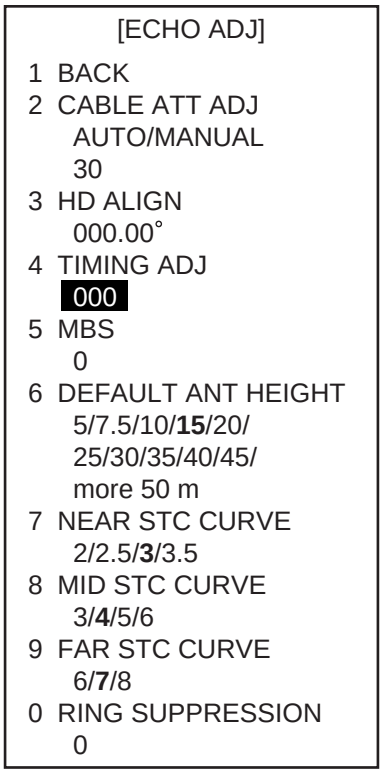
1. Select a stationary target echo at a range between 0.125 and 0.25 nm, preferably near the heading line.
2. Operate the EBL control to bisect the target echo.
3. Read the target bearing.
4. Measure the bearing of the stationary target on the navigation chart and calculate the difference between actual bearing and apparent bearing on the radar screen.
5. Press the [MENU] key to show the main menu.
6. While pressing and holding down the [HL OFF] key, press the [MENU] key five times.

7. Press [0] key to show the [INITIALIZE] menu.




**Note:** See next page to access the INITIALIZE menu with the trackball style control unit RCU-015.

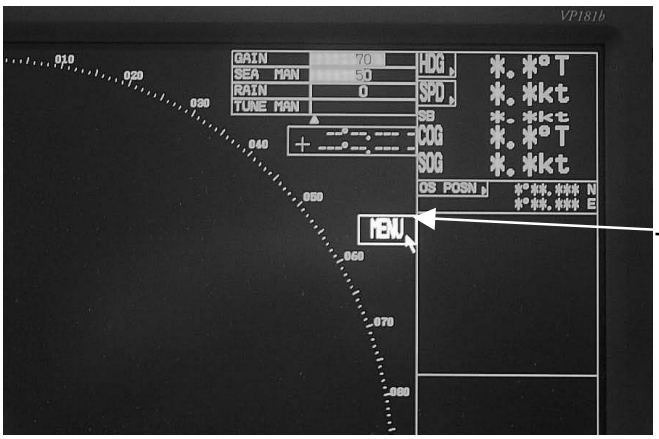
8. Press [2] key to open the [ECHO ADJ] menu.



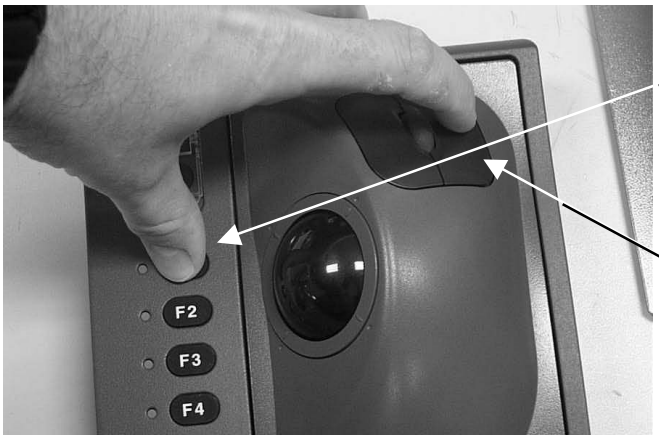

*ECHO ADJ menu*

9. Press [3] key to choose the HD ALIGN option.
10. Key in the bearing difference. The setting range is 0 to 359.9 °
11. Confirm that the target echo is displayed at correct bearing on the screen.
12. Press the [MENU] key to finish.

## How to Access the Installation Mode with the RCU-015 Trackball Style Controller




1. By using the trackball, move the pointer until it highlights the MENU box as shown. **DO NOT CLICK** the menu box, just leave the arrow over the menu.




2. Press and hold down the F1 key. Keep it held down during the next step.

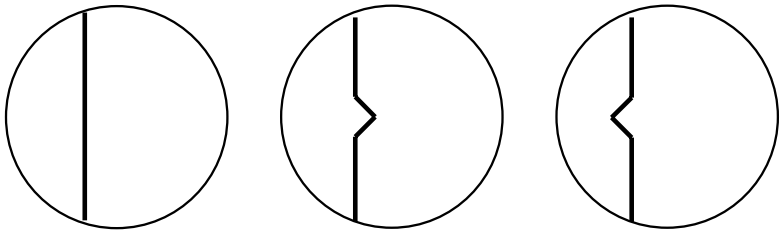
**3. Then**, click on the right controller button 5 times. You should hear a “triple Beep” on the fifth press.

The INITIALIZE menu will appear. Click on INSTALLATION to access the installation menus.

# 3.4 Adjustment Sweep Timing

Sweep timing differs with respect to the length of the signal cable between the antenna unit and the processor unit. Adjust sweep timing at installation to prevent the following symptoms:

- The echo of a “straight” target (for example, pier), on the 0.25 m range, will appear on the display as being pulled inward or pushed outward. See Figure below.
- The range of target echoes will also be incorrectly shown.




*Examples of correct and incorrect sweep timings*

1. Transmit on the 0.25 nm range.
2. Adjust radar picture controls to display picture properly.
3. Select a target echo which should be displayed straightly.
4. Press [4] key to choose the [TIMMING ADJ] on the [ECHO ADJ] menu.

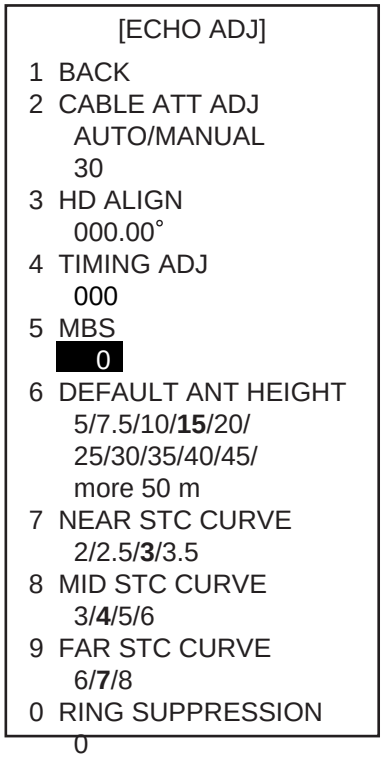
```
[ECHO ADJ]
1 BACK
2 CABLE ATT ADJ
   AUTO/MANUAL
   30
3 HD ALIGN
   000.00°
4 TIMING ADJ
   000
5 MBS
   0
6 DEFAULT ANT HEIGHT
   5/7.5/10/15/20/
   25/30/35/40/45/
   more 50 m
7 NEAR STC CURVE
   2/2.5/3/3.5
8 MID STC CURVE
   3/4/5/6
9 FAR STC CURVE
   6/7/8
0 RING SUPPRESSION
   0
```

5. Rotate the wheel to set a suitable value which causes the target to be displayed straightly. The setting range is 0 to 4095.
6. Press the [MENU] key to finish.

# 3.5 Suppressing Main Bang

If main bang appears at the screen center, suppress it as follows.

1. Transmit the radar on a long range and then wait ten minutes.
2. Adjust gain to show a slight amount of noise on the display.
3. Select the 0.25 nm range. Adjust sea clutter to suppress.
4. Press [5] key to choose the MBS on the [ECHO ADJ] menu.




5. Rotate the wheel to set a suitable value so that the main bang disappears. The setting range is 0 to 255.
6. Press the [MENU] key to finish.

# 3.6 Other Settings

## ECHO menu setting

Open the [ECHO ADJ] menu as described on page 3-2.

[ECHO ADJ]
1 BACK
2 CABLE ATT ADJ
AUTO/MANUAL
30
3 HD ALIGN
000.00˚
4 TIMING ADJ
000
5 MBS
0
6 DEFAULT ANT HEIGHT
5/7.5/10/**15**/20/
25/30/35/40/45/
more 50 m
7 NEAR STC CURVE
2/2.5/**3**/3.5
8 MID STC CURVE
3/**4**/5/6
9 FAR STC CURVE
6/**7**/8
0 RING SUPPRESSION
0

To close the menu, press the [MENU] key.

### CABLE ATT ADJ

Before adjusting, set the radar as follows:
IR: 2, ES: off, EAV: off, 24nm range, long pulse
(Same as default setting of PICTURE1)
To adjust the cable attenuation manually, choose MANUAL by pressing [2] and the [ENTER] key, and then rotate the wheel so that noise just appears on the screen when the gain is set to 80. Default setting is 30 for the antenna cable length of 15m. The setting range is 0 to 73.
To adjust automatically, choose AUTO and press the [ENTER] key. The message “(CABLE ATT ADJ” appears in red at the bottom of the screen. It takes about five minutes to complete the adjustment, after which the exedra goes into stand-by.

### DEFAULT ANT HEIGHT

Select height (m) of the radar antenna unit from the sea surface among 5, 7.5, 10, 15, 20, 25, 30, 35, 40, 45 and “more 50 m”.

### NEAR STC CURVE, MID STC CURVE AND FAR STC CURVE

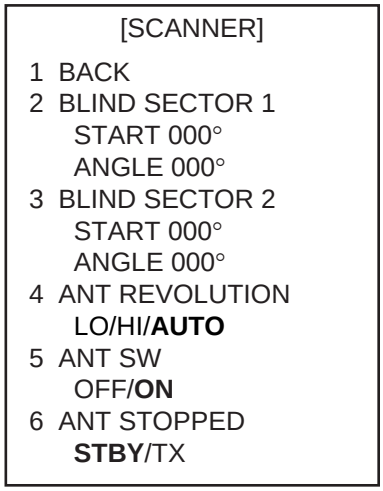
Use the default setting. Change the setting if desired according to sea condition.

**RING SUPPRESSION**

This is mainly used to removes “ring” noise which appears in the waveguide-type radar. Adjust so the rings disappear at the range of 0.125 nm. The setting range is 0 to 255.

## Scanner setting

1. Open the INITIALIZE menu described on page 3-3 and 3-4.
2. Press [3] key to open the SCANNER menu.




To close the menu, press the [MENU] key.

**BLIND SECTOR 1 and BLIND SECTOR 2**

Set area (up to 2) where no radar pulses will be transmitted. For example, set the area where an interfering object at the rear of the scanner would produce a dead sector (area where no echoes appear) on the display. To enter an area, enter start bearing relative the heading and dead sector angle. To erase the area, enter 0 for both the START and ANGLE sections. The setting range of START is 0 to 359° and ANGLE is 0 to 180°.

**ANT REVOLUTION**

Not used for FAR-2137S/2837S/2137S-BB.

**ANT SW and ANT STOPPED**

This is used for antenna maintenance by serviceman.

## INSTALLATION menu setting

Open the INSTALLATION menu by pressing [4] key on the INITIALIZE menu.

[INSTALLATION]

1 BACK
2 RADAR
MAIN/SUB
3 RANGE UNIT *
NM/SM/km/kyd
4 RADAR NO**
1/2/3/4/5/6/7/8
5 RADAR POSN
FORE/**MAIN TOP**/
MAIN 2ND/MAIN 3RD/
AFT/PORT/
STAR BOARD
6 MODEL
6/**12**/25 UP/25 DOWN/
50/30 UP/30 DOWN/60
7 TYPE
**IMO**/A/B/C
8 ON TIME
XX.XH
9 TX TIME
XX.XH
0 PM GAIN ADJ
XXX

*: Not displayed on IMO-type radar.

**: No.1-4: with antenna unit
No.5-8: without antenna unit

### RADAR

Choose main radar or sub radar.

### RANGE UNIT

Choose NM, SM, km or kyd (kilo yard) as appropriate, however-IMO type radar is “NM” only.

### RADAR NO and RADAR POSN

For multiple radar system using the network hub, set number (name) and antenna position for each system to easily distinguish the radar configuration.

### MODEL

Confirm the model of your radar. If the setting of this item is different from your model (combination of the antenna unit), the radar functions abnormally.
Select “30 UP” for FAR-2137S/ 2837S/ 2137S-BB.

**TYPE**

Choose type of radar: IMO, A, B, or C.

**ON TIME and TX TIME**

These items show number of hours the radar has been turned on and transmitted, respectively. Value can be changed; for example, after replacing magnetron TX Time can be reset to 0.

**PM GAIN ADJ**

When you choose this item, the radar setting changes as follows.

| | |
|---|---|
| RANGE: | 24 NM |
| PULSE: | LONG |
| BLIND SECTOR: | OFF |
| STC: | OFF by Manual |
| RAIN: | OFF by Manual |
| ECHO STRECH: | OFF |
| ECHO AVERAGE: | OFF |
| VIDEO CONTRAST: | A |
| TUNE: | AUTO |

1. Adjust the GAIN control so that a slight amount of white noise appears on the screen. Arcs for performance monitor appear on the screen (Fig.1).
2. Adjust PM GAIN ADJ so that outer arc just disappears (Fig.2).

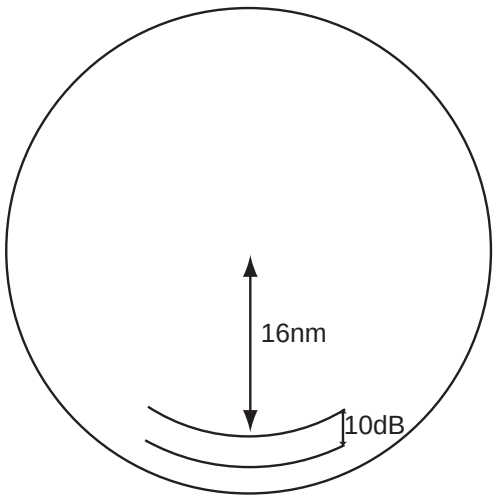



*Fig.1*

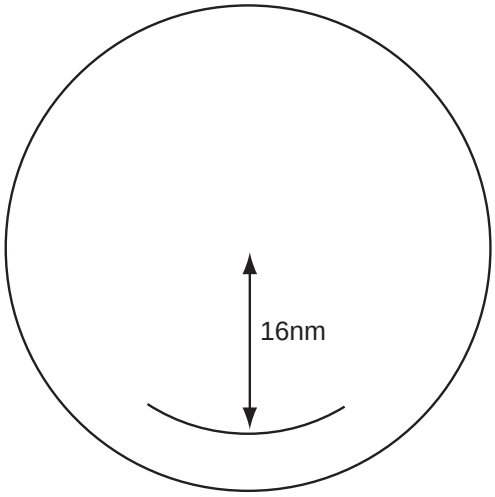
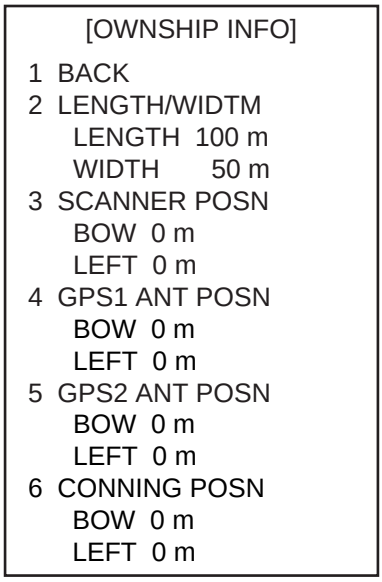



*Fig.2*

## OWN SHIP INFO menu setting

Open the OWN SHIP INFO menu by pressing [5] key on the INITIALIZE menu.




### LENGTH/WIDTH and SCANNER POSN

To inscribe own ship shape on the screen when you choose it on the menu, enter length and width of the ship and antenna position from the bow and left sides.
The setting ranges are as follows.

LENGTH: 0 to 999 m
WIDTH: 0 to 99 m
BOW: 0 to 999 m
LEFT: 0 to 99 m

### GPS 1 ANT POSN and GPS 2 ANT POSN

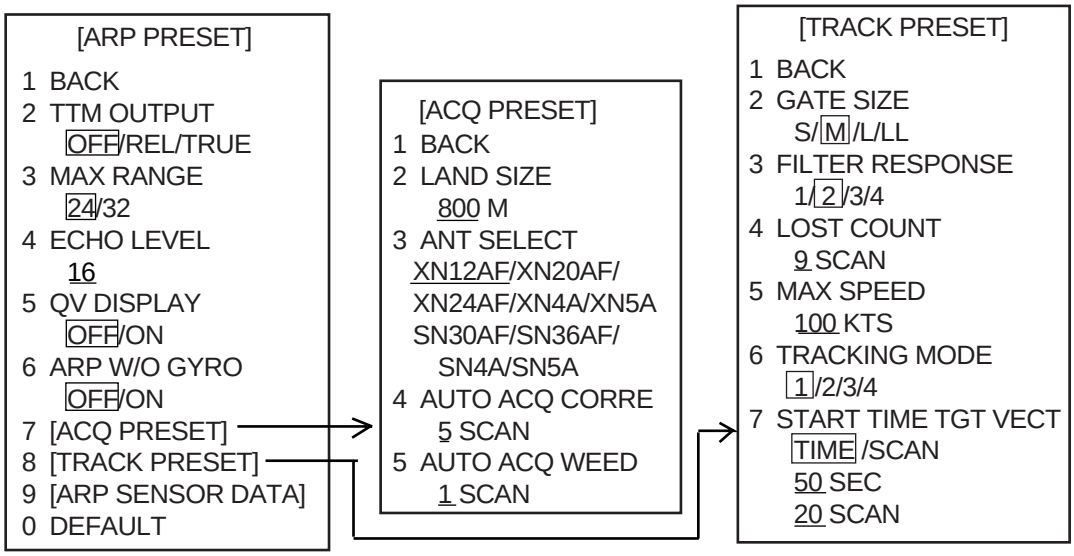
These items are needed for AIS information. Enter the GPS antenna position from the bow and left sides. The setting ranges are the same as above.

### CONNING POSN

Enter the conning position in the wheelhouse, from the bow and left sides. The setting ranges are the same as above.
When you set the display reference point to the conning position, these values are used to correct the radar antenna position.

## ARPA PRESET menu setting

Open the ARPA PRESET menu by pressing [6] key on the INITIALIZE menu.




### TTM OUTPUT

Set the output format of tracked targets among OFF, REL and TRUE.

| | |
|---|---|
| OFF: | No output |
| REL (relative): | Target bearing from own ship, degree relative. |
| | Target course, degree relative. |
| TRUE: | Target bearing, degree true. |
| | Target course, degree true. |

### MAX RANGE

Choose the ARPA tracking range, 24 or 32 nm.

### ECHO LEVEL

Set the detection level of echoes. The setting range is 1 to 31.

### QV DISPLAY

OFF: Normal picture
ON: Quantized picture; always off at power on

### ARPA W/O GYRO

If a gyrocompass is not connected, choose the ARPA function, ON(working) or OFF (no working).

### LAND SIZE

Set the land size in units of 100 m. The setting range is 100 to 1000 m.

### ANT SELECT

Set the antenna radiator type of your radar.

**AUTO ACQ CORRE**

Set the correlation count of automatic acquisition. The setting range is 3 to 10.

**AUTO ACQ WEED**

Set the cancel count of automatic acquisition. The setting range is 1 to 5.

**GATE SIZE**

Set the gate size among S, M, L, or LL.

**FILTER RESPONSE**

Set the filter response function. The setting range is 1 to 4.

**LOST COUNT**

Set the lost count. The setting range is 1 to 20.

**MAX SPEED**

Set the maximum tracking speed. The setting range is 40 to 150.

**TRACKING MODE**

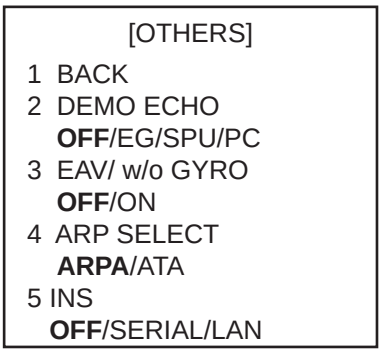
Set the tracking mode among 1 to 4.

**START TIME TGT VECT**

Choose time which a vector appears after acquisition, TIME or SCAN and set seconds or scan counts.

## OTHER menu setting

Open the OTHER menu by pressing [8] key on the INITIALIZE menu.




### EAV w/o GYRO

If a gyrocompass is not connected, choose the echo average function, ON (working) or OFF (no working).

### ARP SELECT

Choose ARPA or ATA depending on your radar system.

### INS

Choose appropriate item according to the ECDIS connected.

OFF: No connection
SERIAL: When connecting FEA-2105 series ECDIS.
LAN: When connecting FEA-2107 series ECDIS.

This page is intentionally left blank.

# 4. INSTALLING OPTIONAL EQUIPMENT

## 4.1 Gyro Converter GC-10

The Gyro Converter GC-10, incorporated inside the processor unit, converts analog gyrocompass reading into digital coded bearing data for display on the radar screen.

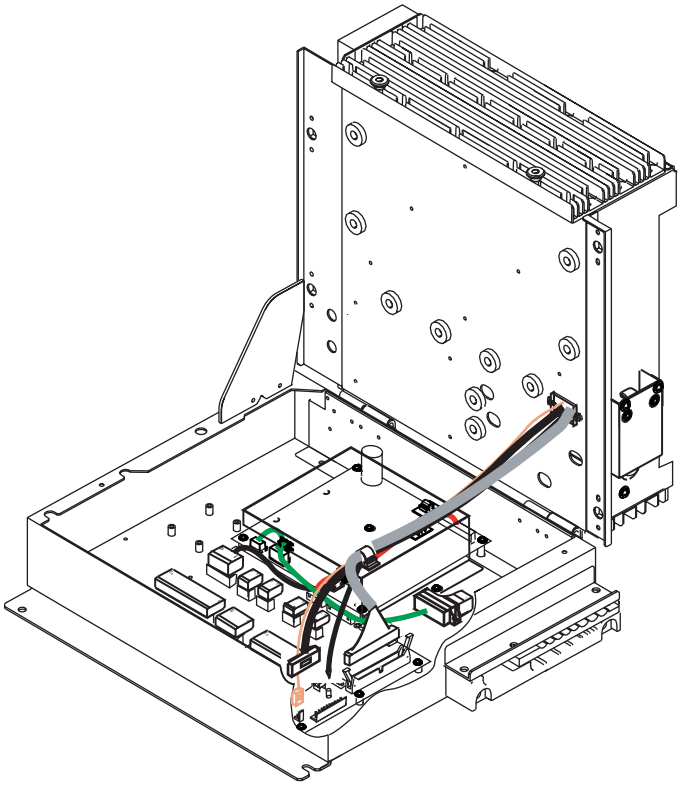
This section explains how to install the GC-10 (mainly consisting of the GYRO CONVERTER board) and set it up according to gyrocompass connected.

### Installing the GYRO CONVERTER board

Necessary Parts: GC-10-2 (Code number 000-080-440)

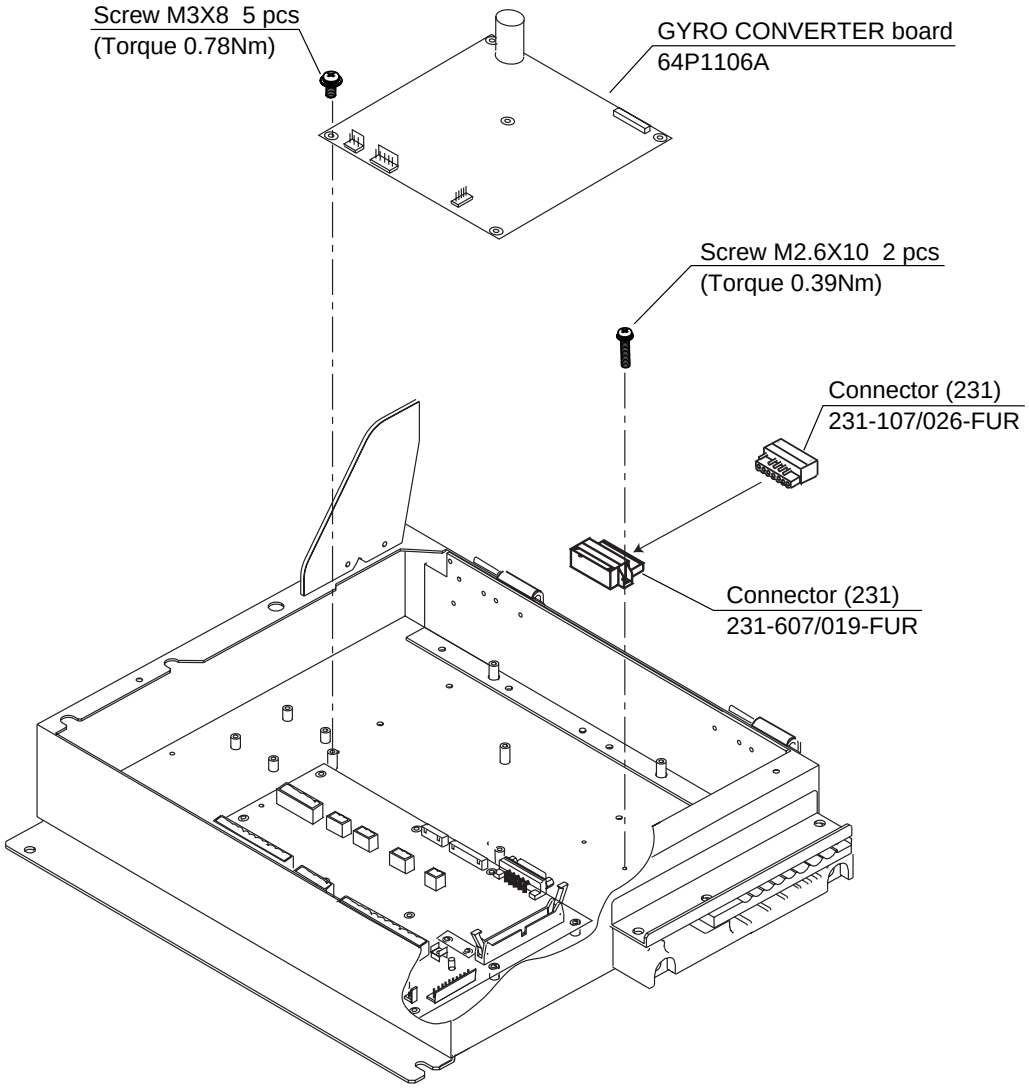
See packing list for details at the back of this manual.

1. Open the processor unit.



*Processor unit (Opened)*

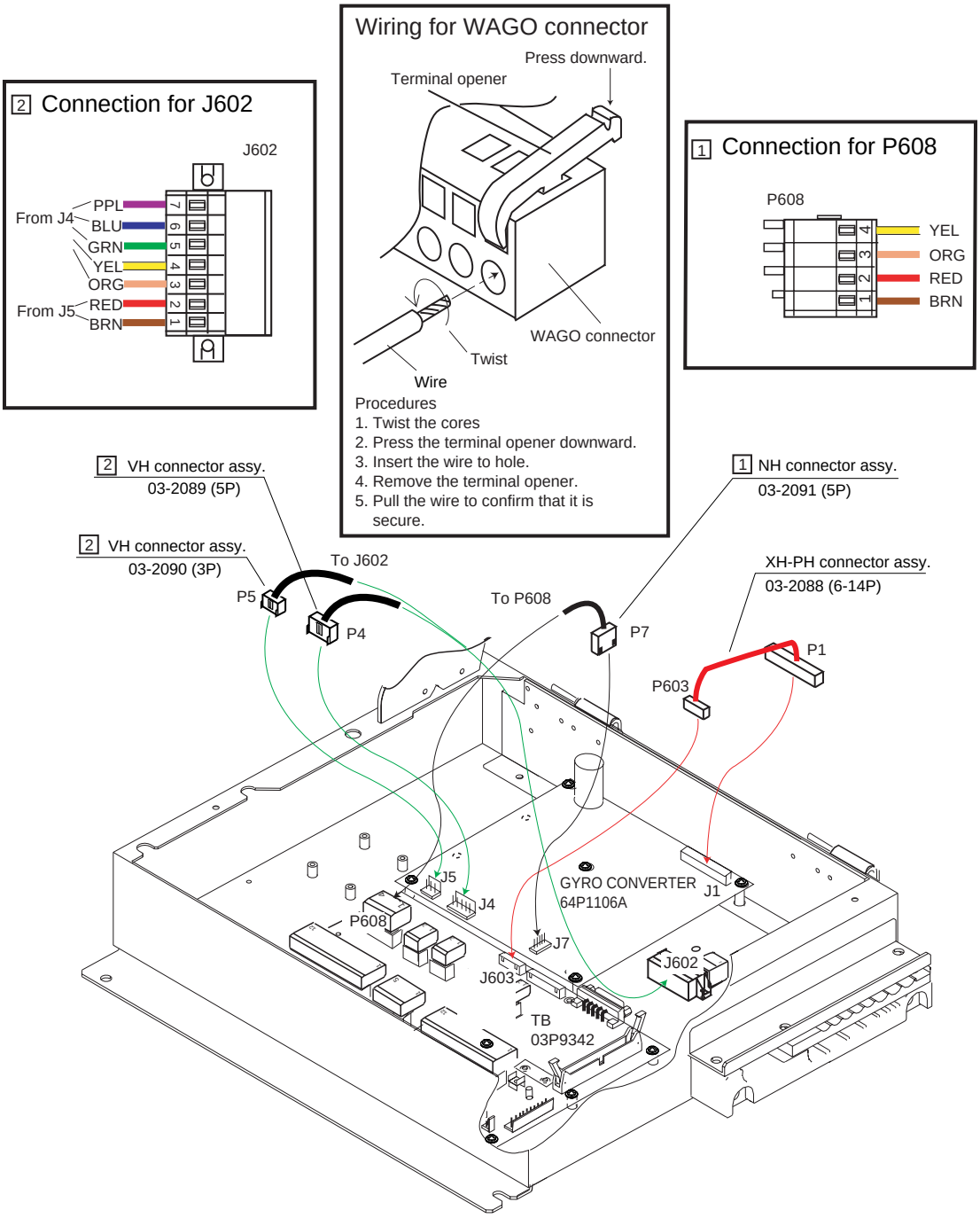
2. Fasten the GYRO CONVERTER board in the processor unit with five washer head screws and male connector 231-607/019-FUR (called J602) with two screws.




*Attaching GYRO CONVERTER board in the processor unit*

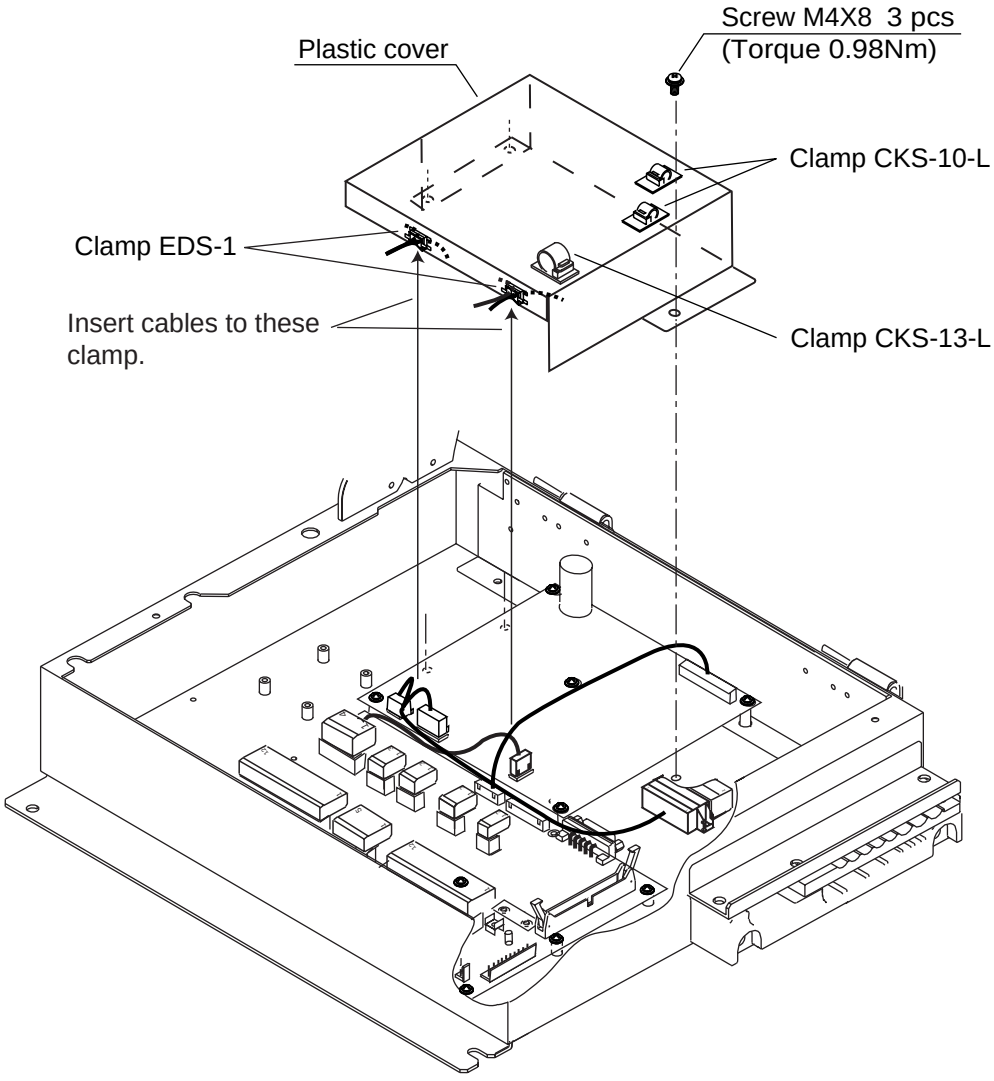
3. Connect the GYRO CONVERTER board and the 03P9342 board with connector assemblies 03-2088 and 03-2091.

4. Connect the GYRO CONVERTER board and J602 with two connector assemblies 03-2089 and 03-2090.




*Connecting connector assemblies*

5. Confirm gyrocompass specifications and set up the DIP switches and jumper wires on the GYRO CONVERTER board according to gyrocompass connected:
   - Setting jumper wires and DIP switches by gyrocompass specifications: page 4-5
   - Setting jumper wires and DIP switches by make and model of gyrocompass: page 4-7
   - Location of jumper wires and DIP switches: page 4-8
6. Pass gyrocompass cable through the cable clamp and connect it to connector J602 as shown in the figure on page 4-3.
7. Attach the clamps on the plastic cover and then attach the cover to the chassis as shown in the figure below. Insert cables to the clamp ED-1, respectively.



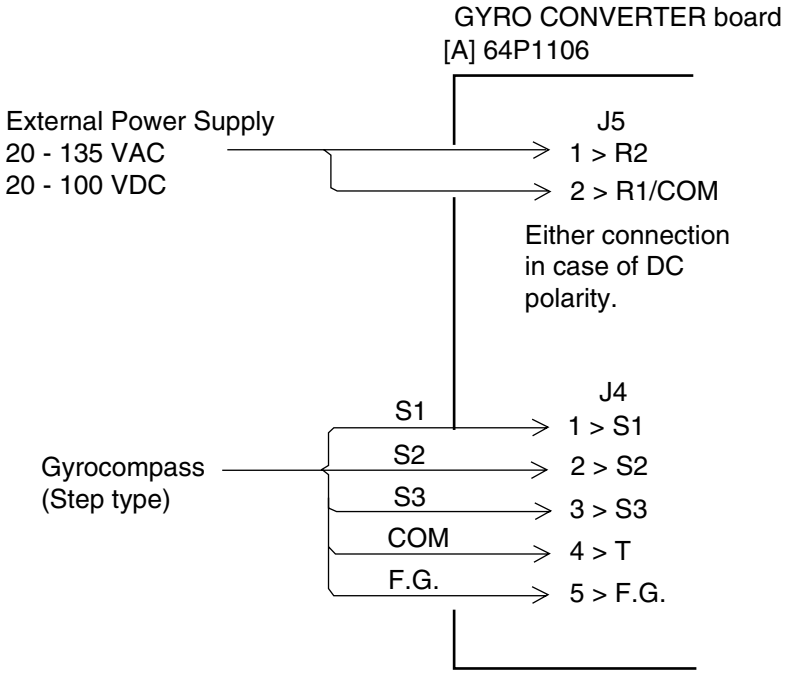

*Attaching plastic cover for GYRO CONVERTER board*

8. Close the processor unit.

## Connection of external power supply

An external power supply is necessary when the repeater signal is step-by-step type and the step voltage is below 20 V or output voltage is less than 5 W.

1. Cut jumper wire JP1 on the GYRO CONVERTER board when an external power supply is used.
2. Connect gyro cable and power cable as shown below.




*Connection of external power supply to GYRO CONVERTER board*

## DIP switch, jumper wire settings

### Default setting

The default setting of all DIP switches is off and all jumper wires are set to "#1." (Note that jumper wire JP1 is set at #1, #2, and #3.) In those settings the gyrocompass having the following characteristics can be directly connected; modification of the GYRO CONVERTER board is not necessary.

AC synchronous signal: 50/60 Hz
Rotor voltage: 60 V to 135 V AC
Stator voltage: 60 V to 135 V AC
Gear ratio: 360x
Supply voltage: 30 V to 135 V AC

If the specifications of the gyrocompass differ from those mentioned above, change jumper wire and DIP switch settings on the GYRO CONVERTER board. Settings may be changed according to gyrocompass specifications (see page 4-6) or make and model of gyrocompass (see page 4-7). For the location of DIP switches and jumper wires, see page 4-8.

Note: If you change the setting with power supplied, set #8 of SW2 from OFF to ON, then OFF again.

## Setting method 1: DIP switch settings and gyrocompass specifications

1) Gyrocompass type

| Gyrocompass type | SW 1-4 | SW 1-5 | SW 1-6 | JP1 |
|---|---|---|---|---|
| AC synchronous | OFF | OFF | OFF | #1, #2, #3 |
| DC synchronous | OFF | OFF | OFF | #2, #3, #4 |
| DC step | ON | OFF | OFF | #4, #5, #6 |
| Full-wave pulsating current | OFF | ON | OFF | #4, #5, #6 |
| Half-wave pulsating current | ON | ON | OFF | #4, #5, #6 |

2) Frequency

| Frequency | SW 1-7 | SW 1-8 | Remarks |
|---|---|---|---|
| 50/60 Hz | OFF | OFF | AC synchronous pulsating current |
| 400 Hz | ON | OFF | AC synchronous pulsating current |
| 500 Hz | OFF | ON | AC synchronous pulsating current |
| DC | ON | ON | DC synchronous DC step |

3) Rotor Voltage (between R1 & R2)

| Rotor Voltage | SW 2-1 | JP3 |
|---|---|---|
| 20 to 45 VAC | ON | #2 |
| 30 to 70 VAC | OFF | #2 |
| 40 to 90 VAC | ON | #1 |
| 60 to 135 VAC | OFF | #1 |

4) Stator Voltage (between S1 & S2)

| Stator Voltage | SW 2-2 | SW 2-3 | JP2 |
|---|---|---|---|
| 20 to 45 VAC, or 20 to 60 VDC | ON | OFF | #2 |
| 30 to 70 VAC, or 40 to 100 VDC | OFF | OFF | #2 |
| 40 to 90 VAC | ON | OFF | #1 |
| 60 to 135 VAC | OFF | OFF | #1 |

5) Ratio

| Ratio | SW 1-1 | SW 1-2 | SW 1-3 |
|---|---|---|---|
| 360X | OFF | OFF | OFF |
| 180X | ON | OFF | OFF |
| 90X | OFF | ON | OFF |
| 36X | ON | ON | OFF |

6) Supply Voltage

| Stator Voltage | JP4 | JP5 |
|---|---|---|
| 20 to 45 VAC, or 20 to 60 VDC | #2 | #2 |
| 30 to 70 VAC, or 40 to 100 VDC | #1 | #1 |

7) AD-10 format data Tx interval

Select data transmitting interval for ports 1 to 6 with jumper wires JP6 and JP7.

**Note:** The Tx interval is available in 25 msec or 200 msec.
25 msec is for radar: 200 msec is for all other equipment.

8) NMEA-0183 Tx interval and Output sentence

| Tx interval | SW 2-5 | SW 2-6 | Output sentence |
|---|---|---|---|
| 1 s | OFF | OFF | HDT+VHW |
| 200 ms | ON | OFF | HDT |
| 100 ms | OFF | ON | HDT |
| 25 ms | ON | ON | HDT |

9) NMEA-0183 Version no.

| Version no. | SW3-1 |
|---|---|
| 1.5 | OFF |
| 2.0 | ON |

10) NMEA-0183 Baud rate

| Baud rate | SW3-2 |
|---|---|
| 4860bps | OFF |
| 38400bps | ON |

11) NMEA-0183 Talker

| Talker | SW3-3 |
|---|---|
| AG | OFF |
| HE | ON |

12) Stator signal breaking detection

| Detection | SW2-7 |
|---|---|
| Execute | OFF |
| No execute | ON |

SW2-4: factory use only
SW3-4: not used

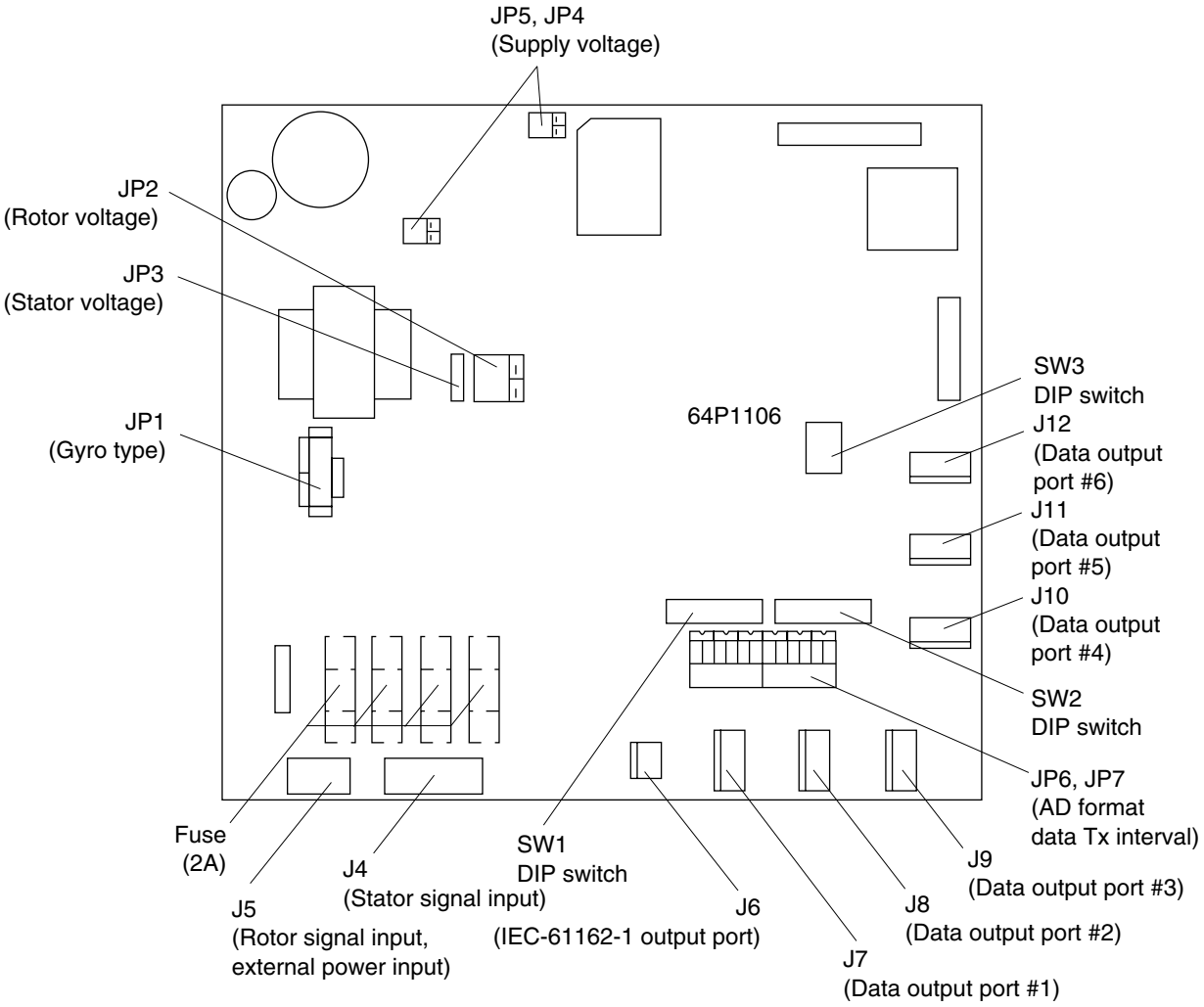
## Setting method 2: by make and model of gyrocompass

| Maker | Models | Specification | SW 1-1 | SW 1-2 | SW 1-3 | SW 1-4 | SW 1-5 | SW 1-6 | SW 1-7 | SW 1-8 | SW 2-1 | SW 2-2 | SW 2-3 | JP1 | JP2 | JP3 | JP4 | JP5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Anschutz | Standard 2,3 | AC synchronous 50/60Hz Rotor voltage: 50/60V Stator voltage: 22V 360x | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | OFF | #1, #2,#3 | #2 | #2 | #1 | # |
| | Standard 4,6 | AC synchronous 50/60Hz Rotor voltage: 50/60V Stator voltage: 90V 360x | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | #1, #2,#3 | #2 | #1 | #1 | # |
| | Standard 20 | DC step 35V 180x COM(-) ,3-wire(+) | ON | OFF | OFF | ON | OFF | OFF | ON | ON | - | ON | OFF | #4, #5,#6 | #2 | - | #2 | # |
| Yokogawa Navtec (Plaith type) | C-1/1A/2/3 A-55, B-55 | AC synchronous 50/60Hz Rotor voltage: 50/60V Stator voltage: 22V 360x | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | OFF | #1, #2,#3 | #2 | #2 | #1 | # |
| | CMZ-700 | DC step 24V 180x COM(+), 3-wire(-) | ON | OFF | OFF | ON | OFF | OFF | ON | ON | - | ON | OFF | Remo-ve | #2 | - | * | * |
| | CMZ-250X/ 300X/500 | DC synchronous 360x | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | - | ON | OFF | Remo-ve | #2 | - | * | * |
| | | DC step 35V 180x COM(+),3-wire(-) | ON | OFF | OFF | ON | OFF | OFF | ON | ON | - | ON | OFF | #4, #5,#6 | #2 | - | #2 | #2 |
| | CMZ-100/200/ 300 C-1Jr,D-1Z/1/3 IPS-2/3 | AC synchronous 50/60Hz Rotor voltage: 100V Stator voltage: 90V 360x | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | #1, #2,#3 | #1 | #1 | #1 | #1 |
| | CMZ-50 See note below. | step 35V 180x COM(+),3-wire(-) | ON | OFF | OFF | ON | OFF | OFF | ON | ON | - | ON | OFF | Remo-ve | #2 | - | * | * |
| Plaith | NAVGAT II/III | AC synchronous 50/60Hz Rotor voltage: 50/60V Stator voltage: 68V 360x | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | #1, #2,#3 | #2 | #2 | #1 | #1 |
| Tokimec (Sperry type) | ES-1/2/11 GLT-101/102/ 103/106K/107 | AC synchronous 50/60Hz Rotor voltage: 100/110V Stator voltage: 90V 36x | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | #1, #2,#3 | #1 | #1 | #1 | #1 |
| | ES-11A/110 TG-200 PR222R/2000 PR237L/H GM 21 | AC synchronous 50/60Hz Rotor voltage: 100/110V Stator voltage: 22V 90x | OFF | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | #1, #2,#3 | #1 | #1 | #1 | #1 |
| | MK-14 MOD-1/2/T NK-EN,NK-EI | DC step 70V 180x COM(-), 3-wire(+) | ON | OFF | OFF | ON | OFF | OFF | ON | ON | - | OFF | OFF | #4, #5,#6 | #2 | - | #1 | #1 |
| | SR-130/140 | DC step 70V 180x 5-wire, open collector | ON | OFF | OFF | OFF | ON | OFF | OFF | OFF | - | OFF | OFF | #4, #5,#6 | #2 | - | #1 | #1 |
| | TG-100/5000 PR-357/130/ 140, ES-17 GLT-201/202 /203 | DC step 70V 180x COM(+), 3-wire(-) | ON | OFF | OFF | ON | OFF | OFF | ON | ON | - | OFF | OFF | #4, #5,#6 | #2 | - | #1 | #1 |
| | TG-6000 | DC step 24V 180x | ON | OFF | OFF | ON | OFF | OFF | ON | ON | - | ON | OFF | #4, #5,#6 | #2 | - | #2 | #2 |
| | GM-11 | AC synchronous 50/60Hz Rotor voltage: 100V Stator voltage: 90V 90x | OFF | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | #1, #2,#3 | #1 | #1 | #1 | #1 |
| | SR-120,ES-16 MK-10/20/30 | DC step 35V 180x | ON | OFF | OFF | ON | OFF | OFF | ON | ON | - | ON | OFF | #4, #5,#6 | #2 | - | #2 | #2 |
| Kawasaki | GX-81 | AC synchronous 50/60Hz Rotor voltage: 100/110V Stator voltage: 90V 90x | OFF | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | #1, #2,#3 | #1 | #1 | #1 | #1 |
| Armabrown | MK-10,MKL-1 SERIES1351, MOD-4 | DC step 50V 180x COM(+), 3-wire(-) | ON | OFF | OFF | ON | OFF | OFF | ON | ON | - | OFF | OFF | #4, #5,#6 | #2 | - | #1 | #1 |
| Robertson | SKR-80 | DC step 35V 180x COM(-), 3-wire(+) | ON | OFF | OFF | ON | OFF | OFF | ON | ON | - | ON | OFF | #4, #5,#6 | #2 | - | #2 | #2 |

*: Set JP4 and JP5 according to the voltage of the external power supply.

**Note:** If CMZ-50 has 35VDC, set JP1 to #4, #5, #6.

**Location of DIP switches, jumper wires on the GYRO CONVERTER board**

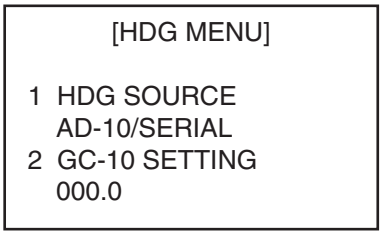



*GYRO CONVERTER board*

## Setting the heading readout on the radar display

Confirm that the gyrocompass is giving a reliable readout. Then, set the heading readout on the radar display with the gyrocompass readout as follows:

1. Roll the trackball to place the arrow in the HDG box at the top right corner of the screen.
2. Push the right button on the trackball module to open the HDG menu.




*HDG menu*

3. Press the [1] key to choose the HDG SOURCE and choose AD-10.
4. Press the [2] key to choose the GC-10 SETTING option.
5. Roll the wheel to set gyrocompass reading.
6. Press the [MENU] key to close the menu.

# 4.2 Memory Card Interface Unit

## Mounting considerations

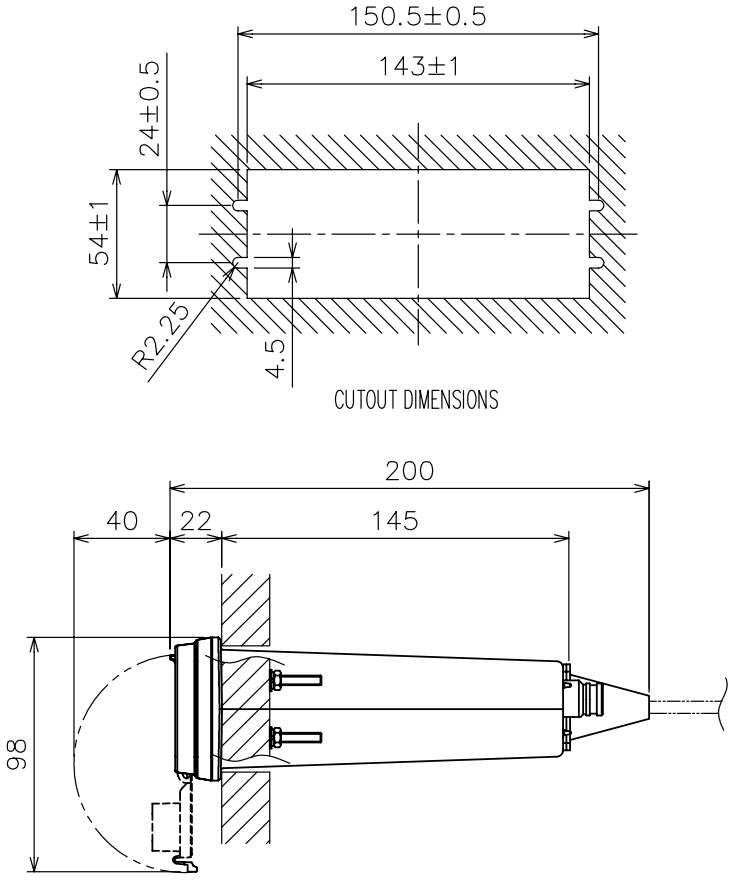
When selecting a mounting location, keep in mind the following points:

- Locate the memory card interface unit away from heat sources because of heat that can build up inside the cabinet.
- Locate the unit away from places subject to water splash and rain.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the unit is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent deviation of a magnetic compass.

### Flush mounting

This unit can be flush-mounted in a panel with the standard installation materials.

1. Prepare a cutout in the mounting location, referring to the outline drawing at the end of this manual.
2. Screw in the threaded rods to the flange of the front panel of the unit securely by hands.
3. Set the unit to the cutout.
4. Insert the flat washer, spring washer and nut in that order for each rod and fasten the nuts.




Flush mounting

**Desktop mount**

For desktop mount, the optional desktop mount kit FP03-10201 is required. Refer to the end of this manual.

1. Fix the mounting bracket 19-023-3081 on the unit with four screws.
2. Mount the above assembly on a desktop with four tapping screws.

**Console mount**

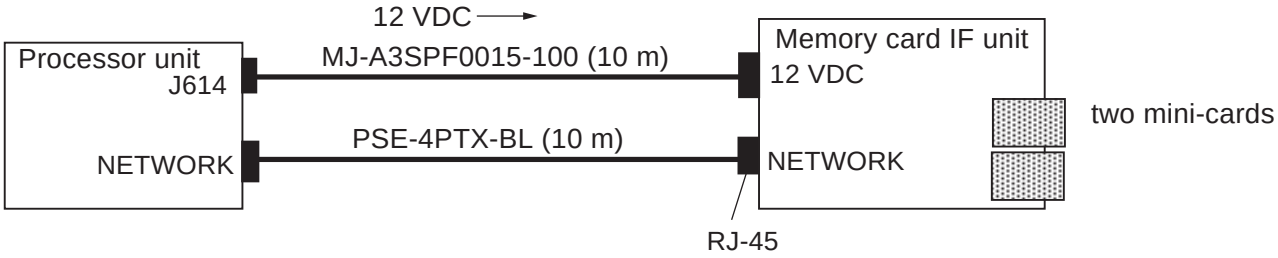
For console mount, the optional console mount kit FP03-10202 is required. Refer to the end of this manual.

1. Fix the mounting bracket 19-023-3091 on the unit with four sets of nut, spring washer and flat washer.

## Connection

**1) Connection between one processor unit and one memory card IF unit**

Connect as shown in the figure below.

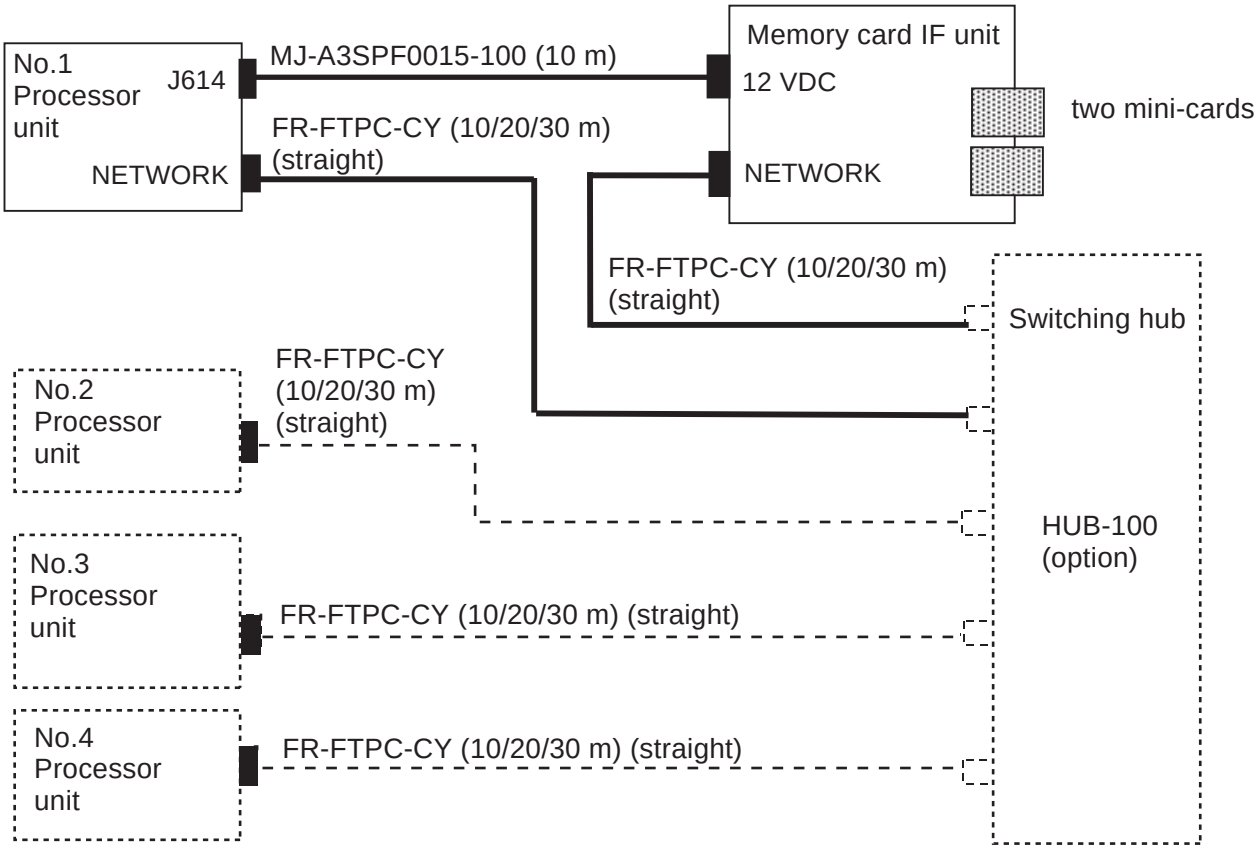



**2) Connection between one memory card IF unit and multiple processor units**

Prepare optional LAN cable kit and switching hub HUB-100. Connect as shown in the next page.

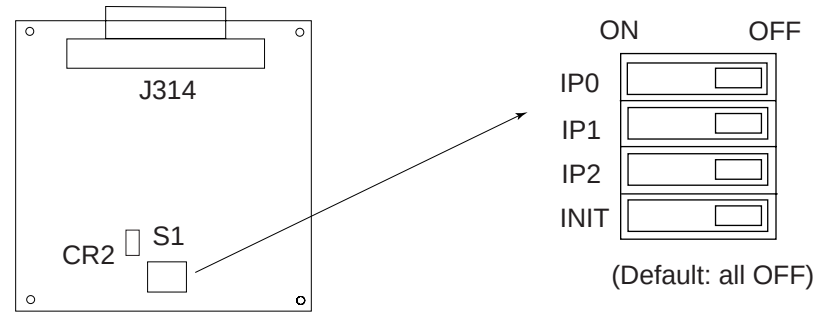
*LAN cable kit*

| Type | Code No. | Contents |
|---|---|---|
| OP03-28900 | 000-082-658 | Cable FR-FTPC-CY (10 m), Modular connector 2 pcs. |
| OP03-28910 | 000-082-689 | Cable FR-FTPC-CY (20 m), Modular connector 2 pcs. |
| OP03-28920 | 000-082-660 | Cable FR-FTPC-CY (30 m), Modular connector 2 pcs. |




**Note:** When two memory card interface units are connected via network, change ID code for the second unit.

1. Remove the cover and set IP0 bit of the DIP switch S1 to ON on the CARDCPU board 03P9333.
2. Set INIT bit of S1 to ON and turn on the power of the radar. Wait till CR2 starts blinking. Never turn off the power until CR2 starts blinking.
3. Turn off the power and set INIT bit to OFF.



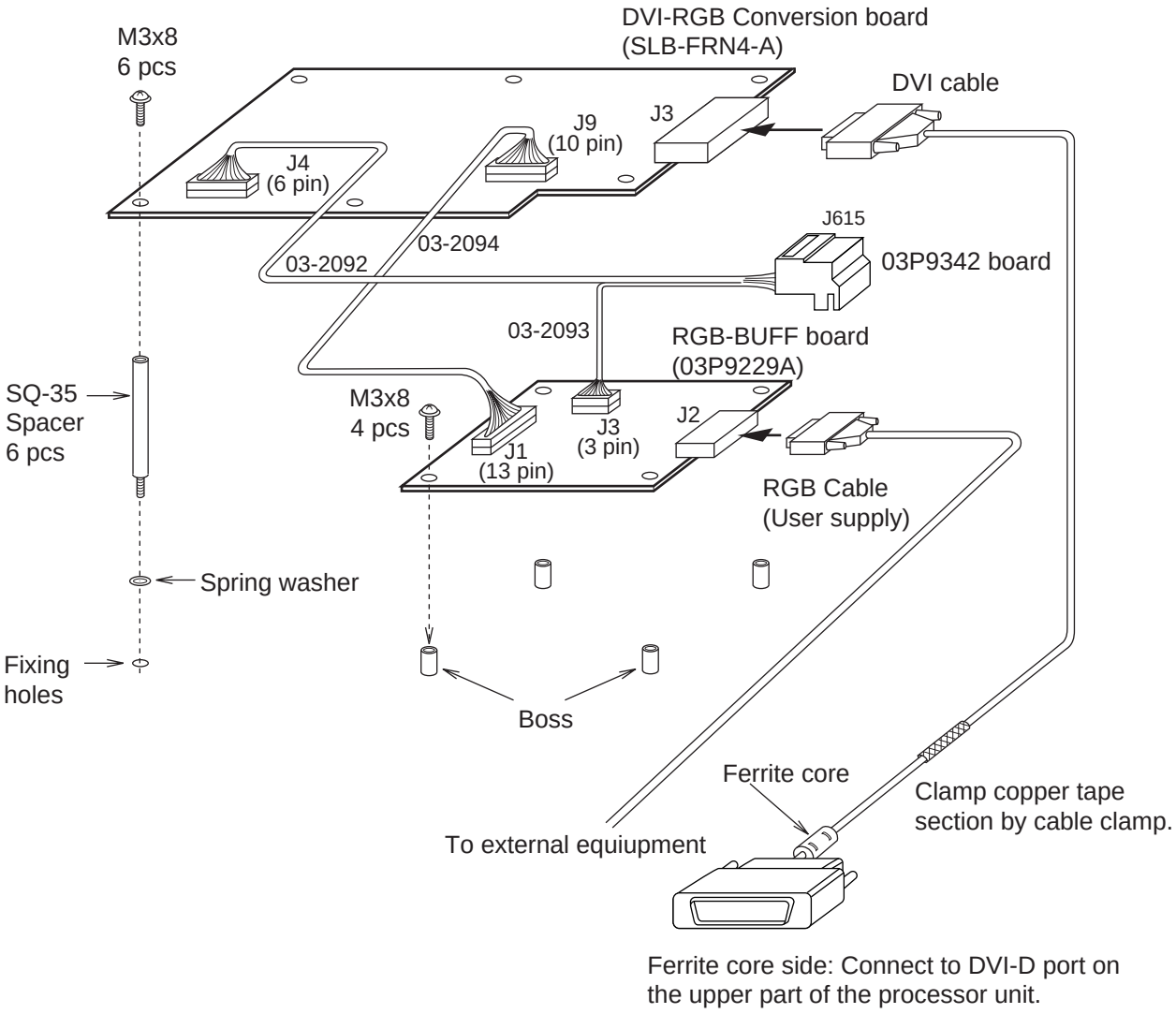

CARDCPU board 03P9333

# 4.3 DVI-RGB Conversion Kit

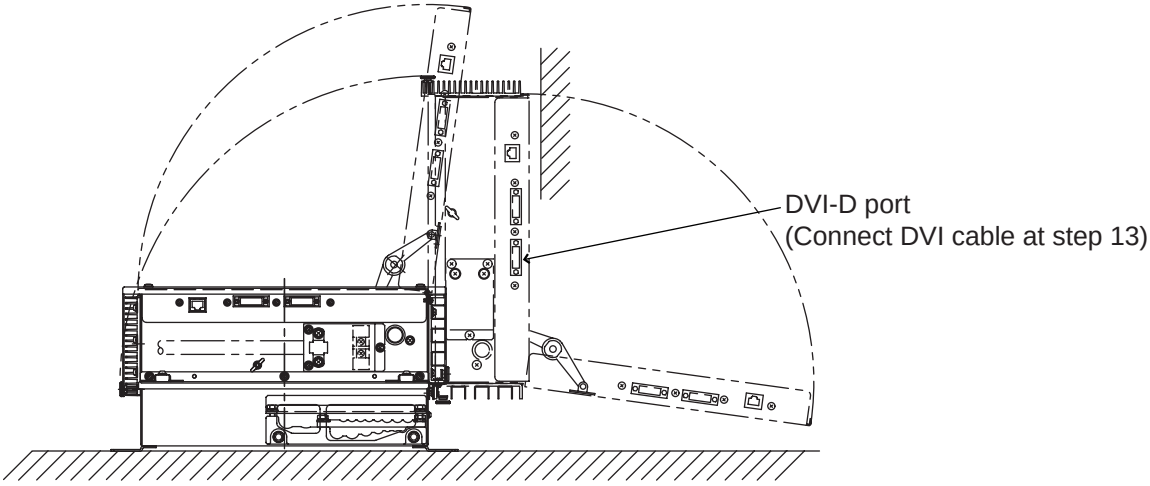
This information provides the procedure necessary for the installation of the DVI-RGB conversion kit. This kit is installed in the processor unit to enable connection of an RGB monitor or VDR (Voyage Data Recorder).

Name: DVI-RGB conversion kit
Type: OP03-180
Code no.: 008-536-070

See packing list for contents. Refer to the figure below for modification.

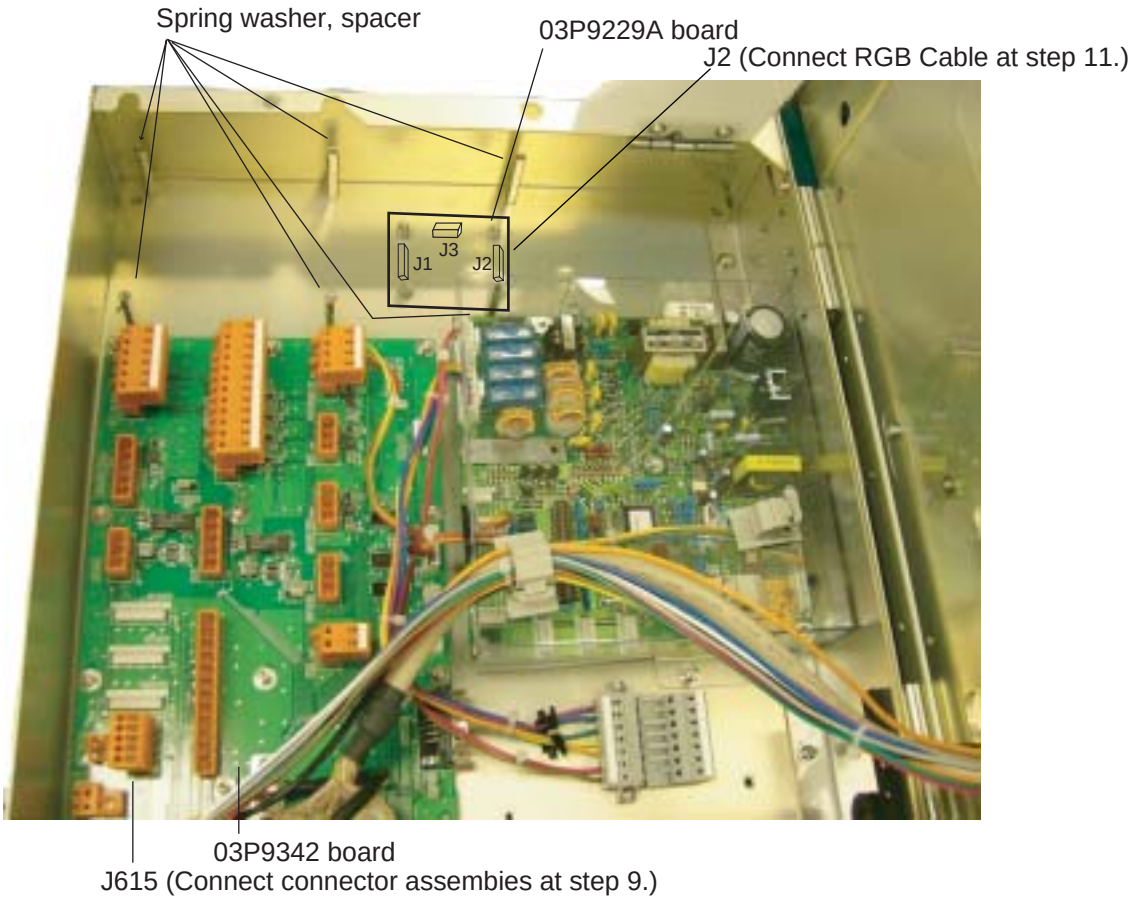


1. Remove the top cover and open the upper part of the processor unit.



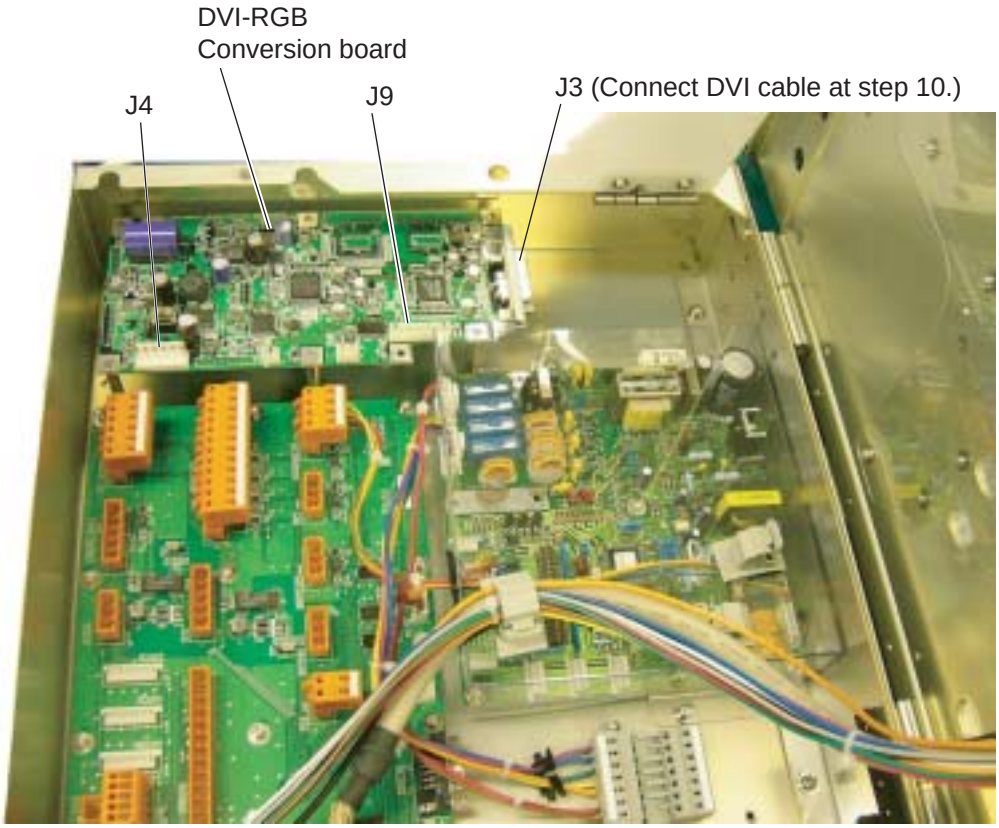

Processor unit

2. Fix the 03P9229A board (RGB-BUFF) with four screws. (See the figure below.)
3. Attach the connector assemblies to J1 and J3 on the 03P9229A board as follows.
   J1 : 13-pin connector of the connector assembly 03-2094
   J3 : 3-pin connector of the connector assembly 03-2093
4. Attach six sets of spring washers and spacers to the positions shown below.




Processor unit (Lower part)

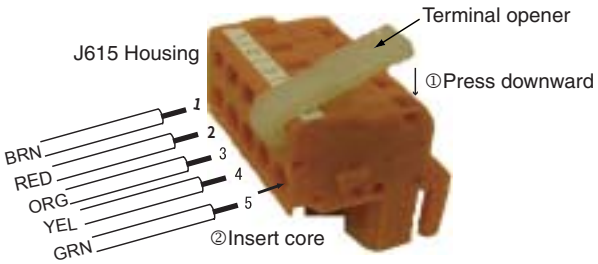
5. Attach the DVI-RGB conversion board to the location shown in the figure on the next page.




*Fixing the DVI-RGB conversion board*

6. Attach the 10-pin connector from J1 on the 03P9229A board to J9 on the DVI-RGB board.
7. Attach the connector assembly 03-2092 to J4 on the DVI-RGB conversion board.
8. Remove connector housing J615 from the 03P9342 board. Connect the cable from J3 on the 03P9229A board and the cable from J4 on the DVI-RGB conversion board to J615. After connection, attach J615 to the 03P9342 board.

   To connect wires to the connector housing, use the terminal opener (supplied as installation materials) as shown below.

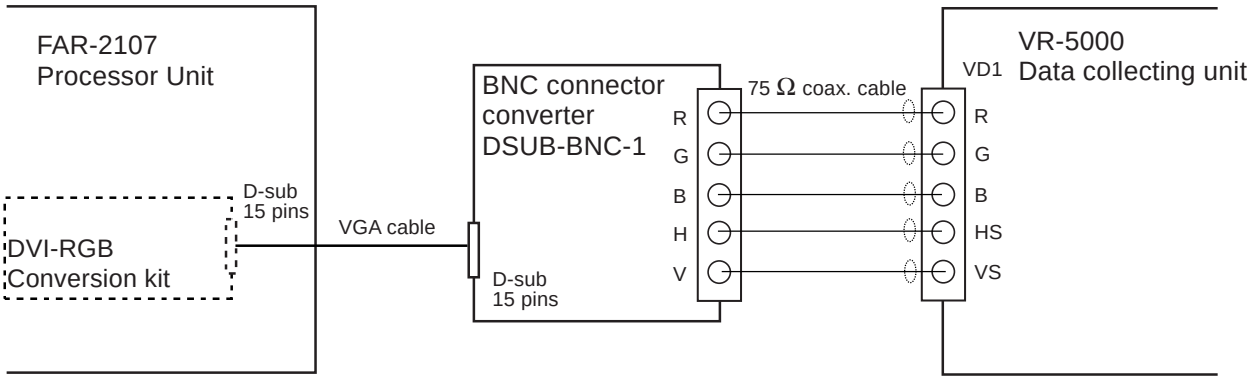



*Connecting wires to the housing*

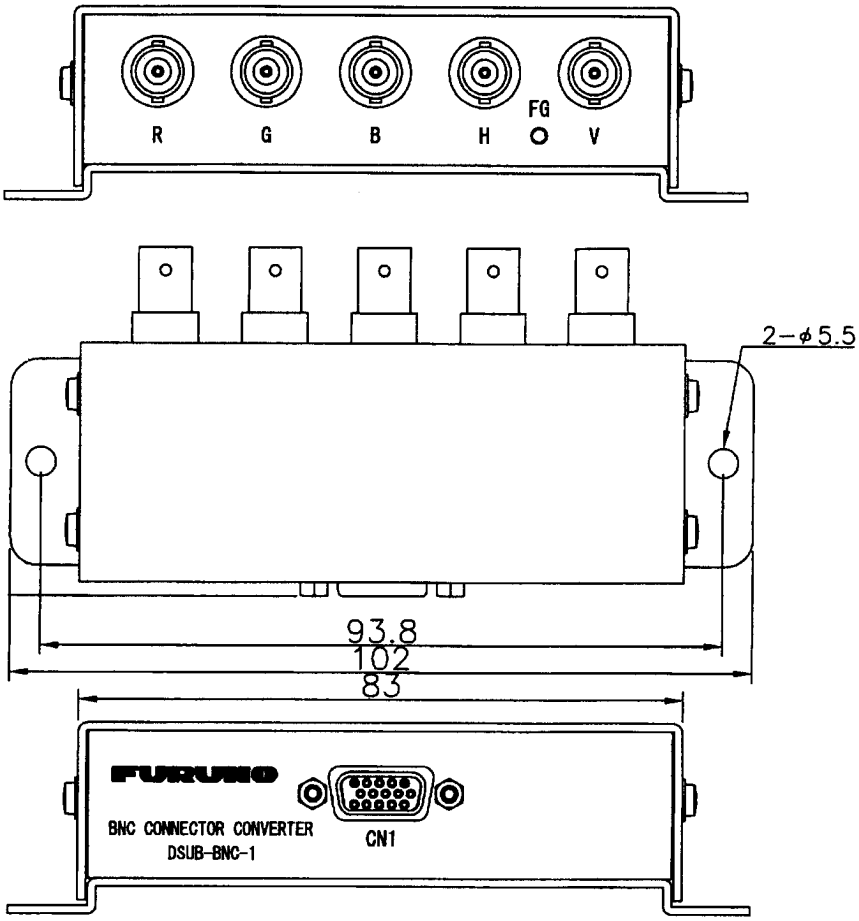
9. Connect the DVI cable to J3 on the DVI-RGB conversion board. Connect the end which does not have the ferrite core.
10. Pass an RGB cable (local supply) through the cable clamp and connect it to J2 on the 03P9229A board.
11. Pass the DVI cable through the cable clamp, laying the section with copper tape in the cable clamp.
12. Assemble the processor unit and connect the other end of the DVI cable to DVI-D port.

# 4.4 BNC Connector Converter

To connect the VR-5000 (FURUNO Voyage Data Recorder) to this radar, the DVI-RGB conversion kit (mentioned at previous paragraph) and the BNC connector converter are required. Also VGA cable (between the processor unit and the BNC connector converter) and five 75 ohms coaxial cables (between the BNC connector converter and VR-5000) are required.



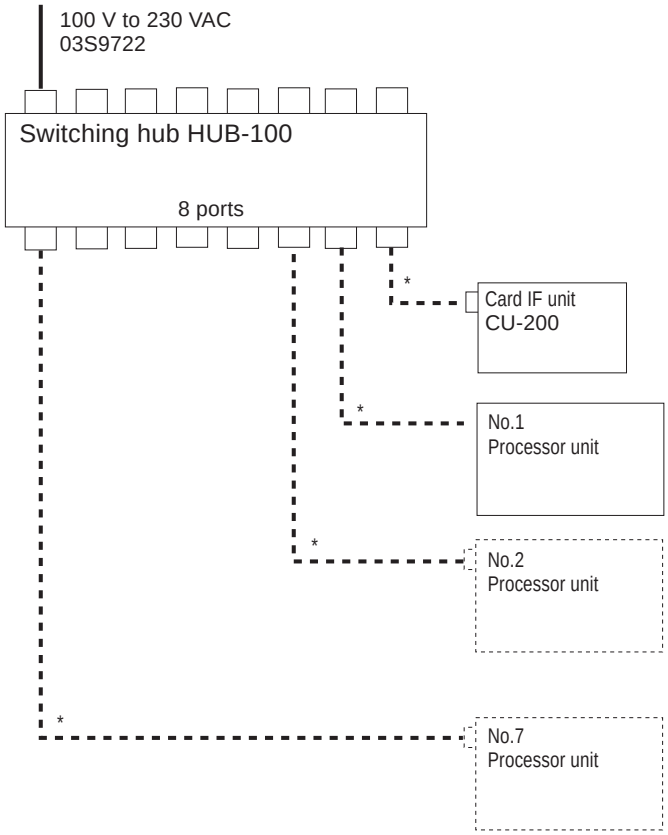

*Interconnection*



# 4.5 Switching Hub

If two or more processor units and memory card IF units are installed, the Switching Hub HUB-100 is required.

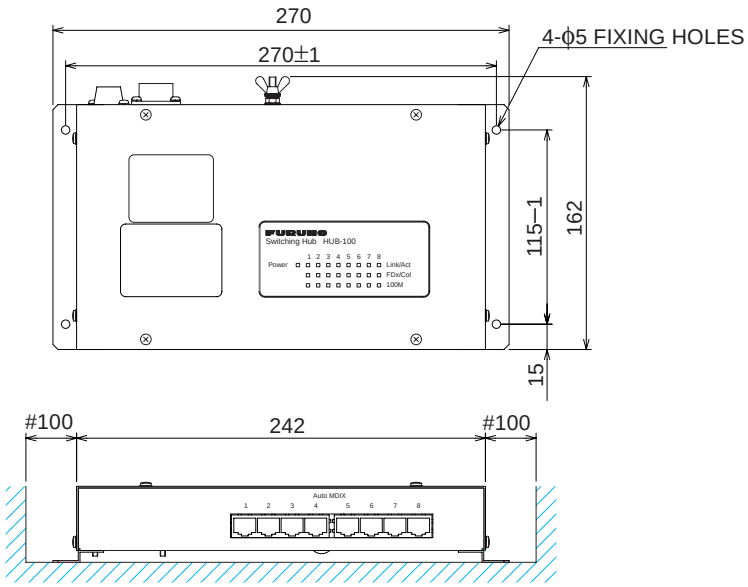
## Interconnection




*: Optional cable(FR-FTPC-CY*10M/20M/30M+moduler connector)or CAT5 cable (user supply)

## Mounting

Fix the unit with four self-tapping screws (4x16).



# 5. INPUT/OUTPUT DATA

Input and output data are shown in the table below.

**Note:** This radar accepts position data fixed by WGS-84 geodetic datum. Set the datum to WGS-84 on the EPFS (GPS, etc.) connected to this radar. If other type of datum is input, the error message "DATUM" appears and the AIS feature is inoperative.

## Input

| Data | Specifications | Contents | Remarks |
|---|---|---|---|
| Heading signal | synchro or step | GC-10 required | AD-10 and IEC 61162 are switched by menu setting. |
| | AD-10 format | External AD-100 | |
| | IEC 61162-2 | | |
| Speed signal | IEC 61162-1 | | |
| Navaid data | IEC 61162-1 | Position, course, speed, LORAN-C TD, waypoint, route, time, wind data, current data, depth, temperature, roll, pitch, ROT | |
| External radar signal | Heading, Bearing, Trigger, Video | No STC control | Operate as remote display |
| Alarm ACK input | Contact closure | | Input from alarm system |
| Track Control unit | RS-422 | | Option |

## Output

| | | | |
|---|---|---|---|
| Radar system data | RS-232C | RSD, OSD, TLL, AAM | For PC plotter |
| ARPA data | IEC 61162-1 | TTM | For ECDIS |
| Remote display signal | HD, BP Trigger, Video | | 2 ports |
| External LCD monitor signal | DVI | Same as main display unit | 2 systems in total |
| External CRT monitor signal | R, G, B, H, V | Same as main display unit | Option |
| Alarm signal | Contact closure | Output to alarm system by using photo-relay | 4 systems, Output contents are selected by menu. |

## IEC 61162 input sentence and priority

| Contents | Sentence and priority |
|---|---|
| Speed (STW) | VBW>VHW |
| Speed (SOG) | VBW |
| Speed (position) | VTG>RMC |
| Heading (True) | HDT* |
| Position | GGA>GLL>RMC>RMA |
| Waypoint | BWR>BWC>RMB |
| Date | ZDA |
| Depth | DPT>DBT>DBS |
| Temperature | MTW |
| Wind | MWV |

*: HDT is IEC61162-2.
OTHERS IEC6112-1 ed2.

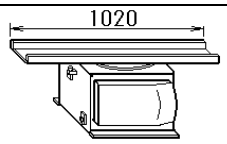
## IEC 61162 output sentence

| Contents | Sentence |
|---|---|
| Target L/L | TLL (Not on IMO radar) |
| Radar system data | RSD |
| Own ship data | OSD |
| ARPA target data | TTM |

*: Not on IMO radar

# PACKING LIST

## RSB-098-080/RSB-099-080/RSB-100-080/RSB-101-080/RSB-102-080

| NAME | OUTLINE | DESCRIPTION/CODE № | Q'TY |
|---|---|---|---|
| **ユニット UNIT** | | | |
| 空中線本体部<br>ANTENNA CHASSIS |  | RSB-098-080-*<br>008-538-770** | 1 |
| **付属品 ACCESSORIES** | | | |
| 付属品<br>ACCESSORIES | | FP03-10101<br>008-538-730 | 1 |
| **工事材料 INSTALLATION MATERIALS** | | | |
| 工事材料<br>INSTALLATION MATERIALS | | CP03-27201<br>008-538-720 | 1 |

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表型式/ｺｰﾄﾞを表します。
CODE NUMBER ENDED BY "**" INDICATES THE NUMBER OF TYPICAL MATERIAL.

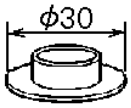
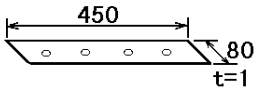
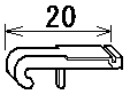
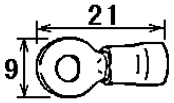
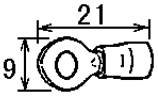
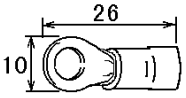
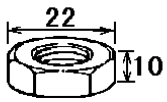
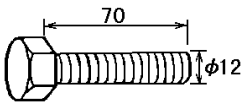
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

| CODE NO. | 008-538-720 | 03G0-X-9401 -1 |
|---|---|---|
| TYPE | CP03-27201 | 1/2 |

# 工事材料表

INSTALLATION MATERIALS

| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名／規格 DESCRIPTIONS | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|
| 1 | ｼｰﾙﾜｯｼｬ<br>SEAL WASHER |  | 03-001-3002-0<br>CODE NO. 300-130-020 | 8 | |
| 2 | 防蝕ゴム<br>CORROSION-PROOF RUBBER MAT |  | 03-029-0301-2<br>CODE NO. 100-091-112 | 2 | |
| 3 | 操作ﾚﾊﾞｰ<br>TERMINAL OPENER |  | 231-131<br>CODE NO. 000-808-981 | 1 | |
| 4 | 圧着端子<br>CRIMP-ON LUG |  | FV2-3<br>CODE NO. 000-108-424 | 2 | |
| 5 | 圧着端子<br>CRIMP-ON LUG |  | FV2-4 ｱｵ<br>CODE NO. 000-538-118 | 3 | |
| 6 | 圧着端子<br>CRIMP-ON LUG |  | FV5.5-4<br>CODE NO. 000-538-123 | 1 | |
| 7 | ﾊﾞﾈ座金<br>SPRING WASHER | | M12 SUS304<br>CODE NO. 000-864-263 | 8 | |
| 8 | ﾐｶﾞｷ平座金<br>FLAT WASHER | | M12 SUS304<br>CODE NO. 000-864-132 | 8 | |
| 9 | 六角ﾅｯﾄ　1種<br>HEX.NUT |  | M12 SUS304<br>CODE NO. 000-863-112 | 16 | |
| 10 | 六角ﾎﾞﾙﾄ　(全ﾈｼﾞ)<br>HEX.BOLT |  | M12X70 SUS304<br>CODE NO. 000-807-825 | 8 | |

03G0-X-9401

FURUNO ELECTRIC CO ., LTD.

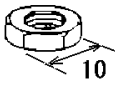
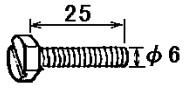
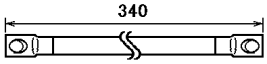
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

| CODE NO. | 008-538-720 | 03G0-X-9401 -1 |
|---|---|---|
| TYPE | CP03-27201 | 2/2 |

# 工事材料表

INSTALLATION MATERIALS

| 番 号 NO. | 名 称 NAME | 略 図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 11 | ﾊﾞﾈ座金<br>SPRING WASHER | | M6 SUS304 | | 1 | |
| | | | CODE NO. | 000-864-260 | | |
| 12 | ﾐｶﾞｷ平座金<br>FLAT WASHER | | M6 SUS304 | | 3 | |
| | | | CODE NO. | 000-864-129 | | |
| 13 | 六角ﾅｯﾄ　1種<br>HEX.NUT |  | M6 SUS304 | | 1 | |
| | | | CODE NO. | 000-863-109 | | |
| 14 | 六角ﾎﾞﾙﾄ<br>HEX.BOLT |  | M6X25 SUS304 | | 1 | |
| | | | CODE NO. | 000-862-180 | | |
| 15 | ｱｰｽ線<br>GROUNDING WIRE |  | RW-4747-1 03S4747-2 | | 1 | |
| | | | CODE NO. | 000-566-000 | | |

03G0-X-9401

FURUNO ELECTRIC CO ., LTD.

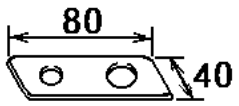
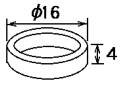
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

| CODE NO. | 008-538-730 | 03G0-X-9501 -0 |
|---|---|---|
| TYPE | FP03-10101 | 1/1 |

# 付属品表

ACCESSORIES

| 番 号<br>NO. | 名 称<br>NAME | 略 図<br>OUTLINE | 型名／規格<br>DESCRIPTIONS | | 数量<br>Q'TY | 用途／備考<br>REMARKS |
|---|---|---|---|---|---|---|
| 1 | つり上げ金具<br>LIFTING FIXTURE |  | 03-015-3233-0 | | 2 | |
| | | | CODE NO. | 100-090-720 | | |
| 2 | 取付用ｶﾗｰ<br>COLLAR FOR LIFTING FIXTURE |  | 03-015-3234-0 | | 2 | |
| | | | CODE NO. | 100-090-730 | | |

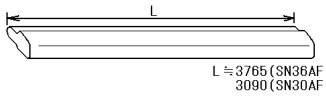
03G0-X-9501

FURUNO ELECTRIC CO .,LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

# PACKING LIST

## SN30AF/SN36AF

| NAME | OUTLINE | DESCRIPTION/CODE № | Q'TY |
|---|---|---|---|
| **ユニット UNIT** | | | |
| ｱﾝﾃﾅ組品<br>ANTENNA |  | SN30AF<br>008-505-950 ** | 1 |
| **ｱﾝﾃﾅ工材 ANTENNA INSTALLATION MATERIALS** | | | |
| 工事材料<br>INSTALLATION MATERIALS | | SN5AF/7AF/30AF/36AF<br>008-254-590 | 1 |

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表型式/ｺｰﾄﾞを表します。
CODE NUMBER ENDED BY "**" INDICATES THE NUMBER OF TYPICAL MATERIAL.

**(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)**

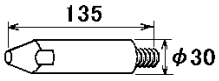
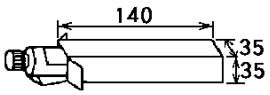
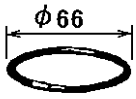
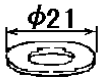
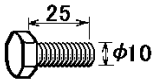
FURUNO

| CODE NO. | 008-254-590 | 03CQ-X-9421 -0 |
|---|---|---|
| TYPE | | 1/1 |

# 工事材料表

INSTALLATION MATERIALS

SN5AF/SN7AF/SN7AF-MSA
SN30AF/SN36AF

| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | ﾋﾟﾝ<br>GUIDE PIN |  | 03-006-4081-0 | | 2 | |
| | | | CODE NO. | 300-640-810 | | |
| 2 | ｽﾘｰﾎﾞﾝﾄﾞ<br>SEALANT |  | 1211 50G | | 1 | |
| | | | CODE NO. | 000-854-118 | | |
| 3 | ｵﾘﾝｸﾞ<br>O-RING |  | JISB2401-1A-G60 | | 2 | |
| | | | CODE NO. | 000-851-309 | | |
| 4 | ﾐｶﾞｷ平座金<br>FLAT WASHER |  | M10 SUS304 | | 10 | |
| | | | CODE NO. | 000-864-131 | | |
| 5 | ﾊﾞﾈ座金<br>SPRING WASHER | | M10 SUS304 | | 10 | |
| | | | CODE NO. | 000-864-261 | | |
| 6 | 六角ﾎﾞﾙﾄ<br>HEX.BOLT |  | M10X25 SUS304 | | 10 | |
| | | | CODE NO. | 000-868-778 | | |

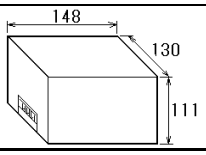


FURUNO ELECTRIC CO ., LTD.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

# PACKING LIST

## PSU-007-*-*-*

| NAME | OUTLINE | DESCRIPTION/CODE № | Q'TY |
|---|---|---|---|
| **ユニット UNIT** | | | |
| 電源制御部<br>POWER CONTROL UNIT |  | PSU-007-70-23-S<br>000-081-241** | 1 |
| **工事材料 INSTALLATION MATERIALS** | | | |
| 工事材料<br>INSTALLATION MATERIALS | | CP03-27301<br>008-538-740 | 1 |

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表型式/ｺｰﾄﾞを表します。
CODE NUMBER ENDED BY "**" INDICATES THE NUMBER OF TYPICAL MATERIAL.

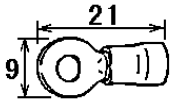
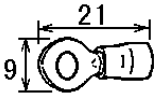
**(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)**

FURUNO

| CODE NO. | 008-538-740 | 03G0-X-9402 -0 |
|---|---|---|
| TYPE | CP03-27301 | 1/1 |

# 工事材料表

INSTALLATION MATERIALS

| 番 号 NO. | 名 称 NAME | 略 図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | 圧着端子<br>CRIMP-ON LUG |  | FV2-3 | | 2 | |
| | | | CODE NO. | 000-108-424 | | |
| 2 | 圧着端子<br>CRIMP-ON LUG |  | FV2-4 ｱｵ | | 6 | |
| | | | CODE NO. | 000-538-118 | | |

03G0-X-9402

FURUNO ELECTRIC CO .,LTD.

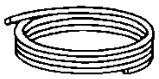
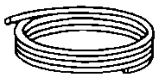
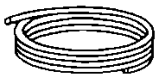
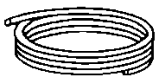
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

| CODE NO. | | 03GL-X-9401 -3 |
|---|---|---|
| TYPE | | 1/1 |

# 工事材料表
INSTALLATION MATERIALS

FAR-2117 series

| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | ｹｰﾌﾞﾙ(14C)<br>CABLE |  <br>L=15M | RW-9600 *15M* | | 1 | 選択 TO BE SELECTED<br>信号ｹｰﾌﾞﾙ<br>SIGNAL CABLE |
| | | | CODE NO. | 000-147-370 | | |
| 2 | ｹｰﾌﾞﾙ(14C)<br>CABLE |  <br>L=30M | RW-9600 *30M* | | 1 | 選択 TO BE SELECTED<br>信号ｹｰﾌﾞﾙ<br>SIGNAL CABLE |
| | | | CODE NO. | 000-149-193 | | |
| 3 | ｹｰﾌﾞﾙ(14C)<br>CABLE |  <br>L=40M | RW-9600 *40M* | | 1 | 選択 TO BE SELECTED<br>信号ｹｰﾌﾞﾙ<br>SIGNAL CABLE |
| | | | CODE NO. | 000-150-490 | | |
| 4 | ｹｰﾌﾞﾙ(14C)<br>CABLE |  <br>L=50M | RW-9600 *50M* | | 1 | 選択 TO BE SELECTED<br>信号ｹｰﾌﾞﾙ<br>SIGNAL CABLE |
| | | | CODE NO. | 000-147-373 | | |

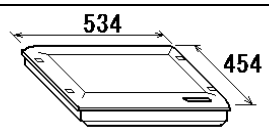
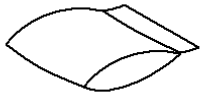
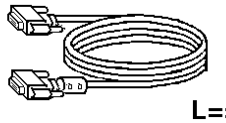


FURUNO ELECTRIC CO ., LTD.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

# PACKING LIST

## MU-201CR

| NAME | OUTLINE | DESCRIPTION/CODE № | Q'TY |
|---|---|---|---|
| **ユニット UNIT** | | | |
| 表示部<br>DISPLAY UNIT |  | MU-201CR<br>000-080-288 ** | 1 |
| **予備品 SPARE PARTS** | | | |
| 予備品<br>SPARE PARTS | | SP03-03900<br>000-081-063 | 1<br>DC用 |
| **予備品 SPARE PARTS** | | | |
| 予備品<br>SPARE PARTS | | SP03-14401<br>008-535-990 | 1<br>AC用 |
| **付属品 ACCESSORIES** | | | |
| 付属品<br>ACCESSORIES |  | FP03-09810<br>008-536-010 | 1 |
| **その他工材 OTHER INSTALLATION MATERIALS** | | | |
| ｹｰﾌﾞﾙ組品<br>CABLE ASSY. |  | DVI-D/D SINGLELINK 5M<br>000-149-054 | 1 |

1.ｺｰﾄﾞ末尾に[**]の付いたﾕﾆｯﾄは代表の型式/ｺｰﾄﾞを表示しています。
DOUBLE ASTERISK DENOTES COMMONLY USED EQUIPMENT.

2.予備品は、AC用,DC用で選択願います。
CHOOSE SPARE PARTS DEPENDING ON AC OR DC POWER.

**(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)**

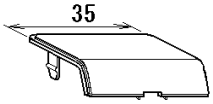
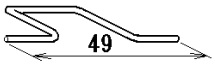
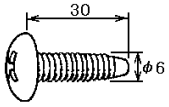
FURUNO

| CODE NO. | 008-536-010 | 03GL-X-9504 -1 |
|---|---|---|
| TYPE | FP03-09810 | 1/1 |

# 付属品表

ACCESSORIES

For MU-201CR

| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | ﾊﾟﾈﾙｶﾊﾞｰ<br>COSMETIC CAP |  | 03-163-1101-1 | | 4 | 表示部用<br>FOR DISPLAY UNIT |
| | | | CODE NO. | 100-305-111 | | |
| 2 | ﾊﾟﾈﾙﾌｯｸ<br>PANEL HOOK |  | 03-163-1102-0 | | 2 | 表示部用<br>FOR DISPLAY UNIT |
| | | | CODE NO. | 100-305-120 | | |
| 3 | +ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1種<br>SELF-TAPPING SCREW |  | 6X30 SUS304 | | 4 | 表示部用<br>FOR DISPLAY UNIT |
| | | | CODE NO. | 000-802-085 | | |

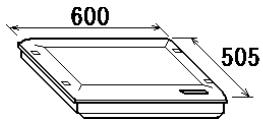
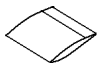
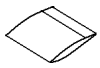
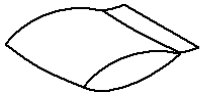
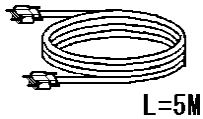


FURUNO ELECTRIC CO ., LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

# PACKING LIST

## MU-231CR

| NAME | OUTLINE | DESCRIPTION/CODE № | Q'TY |
|---|---|---|---|
| **ユニット UNIT** | | | |
| 表示部<br>DISPLAY UNIT |  | MU-231CR<br>000-080-426** | 1 |
| **予備品 SPARE PARTS** | | | |
| 予備品<br>SPARE PARTS |  | SP03-14401<br>008-535-990 | 1<br>AC用 |
| **予備品 SPARE PARTS** | | | |
| 予備品<br>SPARE PARTS |  | SP03-14402<br>008-536-000 | 1<br>DC用 |
| **付属品 ACCESSORIES** | | | |
| 付属品<br>ACCESSORIES |  | FP03-09810<br>008-536-010 | 1 |
| **工事材料 INSTALLATION MATERIALS** | | | |
| ｹｰﾌﾞﾙ組品<br>CABLE ASSY. |  | DVI-D/D SINGLELINK 5M<br>000-147-434 | 1 |

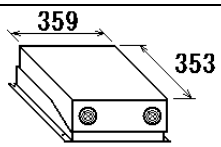
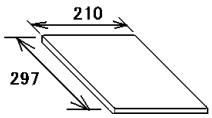
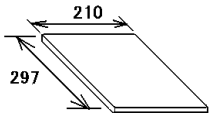
1.ｺｰﾄﾞ末尾に[**]の付いたﾕﾆｯﾄは代表の型式/ｺｰﾄﾞを表示しています。
DOUBLE ASTERISK DENOTES COMMONLY USED EQUIPMENT.

2.予備品は、AC,DCで選択願います。
CHOOSE SPARE PARTS DEPENDING ON AC OR DC POWER.

**(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)**

# PACKING LIST

## RPU-013

| NAME | OUTLINE | DESCRIPTION/CODE № | Q'TY |
|---|---|---|---|
| **ユニット UNIT** | | | |
| 制御部<br>PROCESSOR UNIT |  | RPU-013<br>000-080-3** | 1 |
| **予備品 SPARE PARTS** | | | |
| 予備品<br>SPARE PARTS | | SP03-14404<br>008-535-910 | 1<br>(*1) |
| **工事材料 INSTALLATION MATERIALS** | | | |
| 工事材料<br>INSTALLATION MATERIALS | | CP03-25602<br>008-535-940 | 1<br>(*2) |
| **図書 DOCUMENT** | | | |
| 装備要領書<br>INSTALLATION MANUAL |  | IMJ-35190-*<br>000-147-453** | 1 |
| 取扱説明書<br>OPERATOR'S MANUAL |  | OMJ-35190-*<br>000-147-451** | 1 |

1.ｺｰﾄﾞ末尾に[**]の付いたﾕﾆｯﾄは代表の型式/ｺｰﾄﾞを表示しています。
DOUBLE ASTERISK DENOTES COMMONLY USED EQUIPMENT.

2.予備品は、(*1)のSP03-14404(AC100用)の他にSP03-14405(AC220用),SP03-14406(DC100用)から選択して下さい。
CHOOSE SPARE PARTS FROM AMONG SP03-14404 *1 (FOR 100VAC SPEC.), SP03-14405(FOR 220VAC SPEC.) AND SP03-14406(FOR 24VDC SPEC).

3.工事材料は、(*2)のCP03-25602(AC用)の他に、CP03-25603(DC用)から選択してください。
CHOOSE INSTALLATION MATERIALS FROM CP03-25602 *2(FOR AC SPEC.) AND CP03-25603(FOR DC SPEC.) APPROPRIATELY.

**(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)**

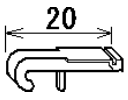
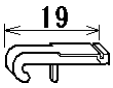
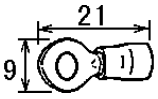
FURUNO

| CODE NO. | 008-535-940 | 03GL-X-9405 -0 |
|---|---|---|
| TYPE | CP03-25602 | 1/1 |

# 工事材料表

INSTALLATION MATERIALS

For RPU-013 AC set

| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | 操作ﾚﾊﾞｰ<br>TERMINAL OPENER |  | 231-131 | | 1 | 制御部用<br>FOR PROCESSOR UNIT |
| | | | CODE NO. | 000-808-981 | | |
| 2 | 操作ﾚﾊﾞｰ<br>TERMINAL OPENER |  | 734-230 | | 1 | 制御部用<br>FOR PROCESSOR UNIT |
| | | | CODE NO. | 000-147-417 | | |
| 3 | 圧着端子<br>CRIMP-ON LUG |  | FV2-4 ｱｵ | | 2 | 制御部用<br>FOR PROCESSOR UNIT |
| | | | CODE NO. | 000-538-118 | | |



FURUNO ELECTRIC CO .,LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

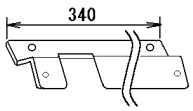
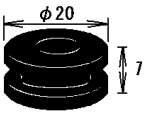
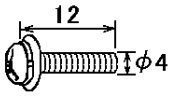
FURUNO

| CODE NO. | 008-535-610 | 03GL-X-9505 -2 |
|---|---|---|
| TYPE | FP03-09850 | 1/1 |

# 付属品表

ACCESSORIES

For RCU-014 Desktop mount kit

| 番 号 NO. | 名 称 NAME | 略 図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | KB直付金具<br>KB FIXING METAL |  | 03-163-7521-1 | | 1 | 操作部用<br>FOR CONTROL UNIT |
| | | | CODE NO. | 100-306-251 | | |
| 2 | ｸﾞﾛﾒｯﾄ<br>CAP |  | G-39 | | 1 | 操作部用<br>FOR CONTROL UNIT |
| | | | CODE NO. | 000-147-167 | | |
| 3 | +-ﾅﾍﾞｾﾑｽﾈｼﾞ B<br>WASHER HEAD SCREW |  | M4X12 C2700W MBNI2 | | 2 | 操作部用<br>FOR CONTROL UNIT |
| | | | CODE NO. | 000-881-447 | | |
| 4 | ｸﾘｱﾊﾞﾝﾎﾟﾝ<br>CUSHION | | TM-180-302 | | 3 | 操作部用<br>FOR CONTROL UNIT |
| | | | CODE NO. | 000-803-043 | | |



FURUNO ELECTRIC CO .,LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

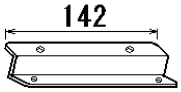
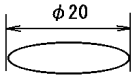
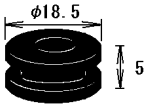
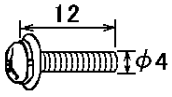
FURUNO

| CODE NO. | 008-535-690 | 03GL-X-9506 -2 |
|---|---|---|
| TYPE | FP03-09860 | 1/1 |

# 付属品表

ACCESSORIES

For RCU-015/016 Desktop mount kit

| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名／規格 DESCRIPTIONS | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|
| 1 | KB直付金具(T)<br>KB FIXING METAL |  | 03-163-7821-1<br>CODE NO. 100-306-291 | 1 | 操作部用<br>FOR CONTROL UNIT |
| 2 | ﾌﾞﾗｲﾝﾄﾞｼｰﾙ<br>SEAL |  | 22-020-1005-1<br>CODE NO. 100-173-591 | 3 | 操作部用<br>FOR CONTROL UNIT |
| 3 | ｸﾞﾛﾒｯﾄ<br>CAP |  | G-49<br>CODE NO. 000-871-309 | 1 | 操作部用<br>FOR CONTROL UNIT |
| 4 | +-ﾅﾍﾞｾﾑｽﾈｼﾞB<br>WASHER HEAD SCREW |  | M4X12 C2700W MBNI2<br>CODE NO. 000-881-447 | 2 | 操作部用<br>FOR CONTROL UNIT |
| 5 | ｸﾘｱﾊﾞﾝﾎﾟﾝ<br>CUSHION | | TM-180-302<br>CODE NO. 000-803-043 | 2 | 操作部用<br>FOR CONTROL UNIT |



FURUNO ELECTRIC CO .,LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

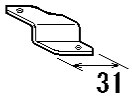
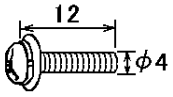
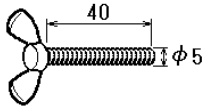
FURUNO

| CODE NO. | 008-535-630 | 03GL-X-9503 -2 |
|---|---|---|
| TYPE | FP03-09870 | 1/1 |

# 付属品表

ACCESSORIES

For RCU-014/015/016 Flush mount kit　　Option

| 番 号 NO. | 名　称 NAME | 略　図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | ﾌﾗｯｼｭﾏｳﾝﾄ金具<br>FLUSH MOUNTING PLATE |  | 03-163-7531-1 | | 4 | |
| | | | CODE NO. | 100-306-261 | | |
| 2 | +-ﾅﾍﾞｾﾑｽﾈｼﾞB<br>WASHER HEAD SCREW |  | M4X12 C2700W MBNI2 | | 4 | |
| | | | CODE NO. | 000-881-447 | | |
| 3 | 六角ﾅｯﾄ　1種<br>HEX.NUT | | M5 SUS304 | | 4 | |
| | | | CODE NO. | 000-863-108 | | |
| 4 | 蝶ﾎﾞﾙﾄ<br>WING SCREW |  | M5X40 SUS304 | | 4 | |
| | | | CODE NO. | 000-149-997 | | |

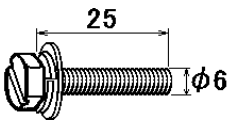
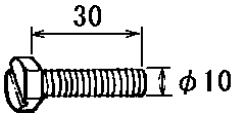
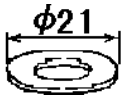
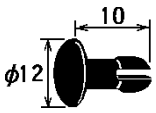
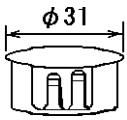
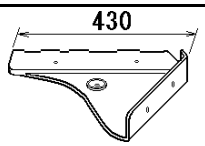
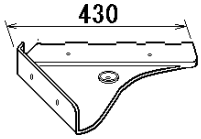
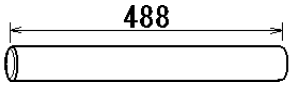
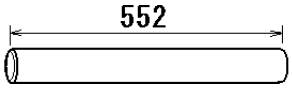


FURUNO ELECTRIC CO.,LTD.

（略図の寸法は、参考値です。　DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

# PACKING LIST

**FP03-09820/09830** For MU-201CR/231CR Desktop mount kit Option

| NAME | OUTLINE | DESCRIPTION/CODE № | Q'TY |
|---|---|---|---|
| **付属品 ACCESSORIES** | | **FP03-09820/09830** | |
| 六角ｾﾑｽB ｽﾘﾜﾘ<br>HEX.BOLT<br>(SLOTTED,WASHER HEAD) |  | M6X25 SUS304<br>000-802-771 | 4 |
| 六角ﾎﾞﾙﾄ ｽﾘﾜﾘ<br>HEX.BOLT |  | M10X30 SUS304<br>000-802-182 | 2 |
| ﾊﾞﾈ座金<br>SPRING WASHER | | M10 SUS304<br>000-864-261 | 2 |
| ﾐｶﾞｷ平座金<br>FLAT WASHER |  | M10 SUS304<br>000-864-131 | 2 |
| ｽﾅｯﾌﾟﾎﾞﾀﾝ<br>PLASTIC RIVET |  | KB-13ﾖｳ ﾎﾞﾀﾝｸﾛ<br>000-570-276 | 4 |
| ﾎｰﾙﾌﾟﾗｸﾞ<br>HOLE PLUG |  | CP-30-HP-13<br>000-147-143 | 2 |
| ﾊﾝｶﾞｰR(20)<br>HANGER R |  | 03-163-1112-0<br>100-305-180 | 1 |
| ﾊﾝｶﾞｰL(20)<br>HANGER L |  | 03-163-1111-0<br>100-305-140 | 1 |
| ﾊﾝｶﾞｰｻｻｴ(20)<br>HANGER STAY |  | 03-163-1113-0<br>100-305-190 | 1<br>(*1) |
| ﾊﾝｶﾞｰｻｻｴ(23)<br>HANGER STAY |  | 03-163-2071-0<br>100-305-370 | 1<br>(*2) |

(*1)は、FP03-09820用です。
*1: FOR FP03-09820.
(*2)は、FP03-09830用です。
*2: FOR FP03-09830.

**(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)**

FURUNO

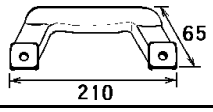
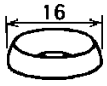
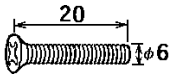
| CODE NO. | 008-535-570 | 03GL-X-9502 -0 |
|---|---|---|
| TYPE | FP03-09840 | 1/1 |

# 付属品表

ACCESSORIES

For MU-201CR/MU-231CR

Option

| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | 取手<br>HANDLE |  | 14-002-1125-2 | | 2 | |
| | | | CODE NO. | 840-211-252 | | |
| 2 | ローゼット座金<br>ROSETTE WASHER |  | M6 C2700W ポリシール クロ | | 4 | |
| | | | CODE NO. | 000-864-910 | | |
| 3 | +丸皿小ネジ<br>OVAL COUNTERSUNK HEAD SCREW |  | M6X20 C2700W<br>ポリシール クロ | | 4 | |
| | | | CODE NO. | 000-861-475 | | |
| 4 | 波座金<br>WAVE WASHER | | WW-6 SUS | | 4 | |
| | | | CODE NO. | 000-864-350 | | |

03GL-X-9502

FURUNO ELECTRIC CO .,LTD.

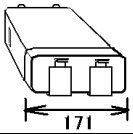
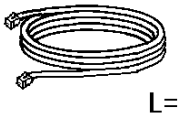
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

# PACKING LIST



## CU-200-FAR

A-19

| NAME | OUTLINE | DESCRIPTION/CODE № | Q'TY |
|---|---|---|---|
| **ユニット UNIT** | | | |
| ﾒﾓﾘｰｶｰﾄﾞｲﾝﾀｰﾌｪｲｽ<br>MEMORY CARD INTERFACE |  | CU-200<br>000-081-569 | 1 |
| **工事材料 INSTALLATION MATERIALS** | | | |
| 工事材料<br>INSTALLATION MATERIALS | | CP03-27401<br>008-539-520 | 1 |
| **その他工材 OTHER INSTALLATION MATERIALS** | | | |
| ｹｰﾌﾞﾙ組品<br>CABLE ASSY. |  <br>L=10M | P5E-4PTX-BL<br>000-147-510 | 1 |
| ｹｰﾌﾞﾙ組品MJ<br>CABLE ASSY | <br>L=10M | MJ-A3SPF0015-100<br>000-142-974 | 1 |

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

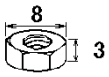
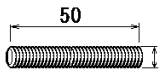
FURUNO

| CODE NO. | 008-539-520 | 03G0-X-9403 -0 |
|---|---|---|
| TYPE | CP03-27401 | 1/1 |

# 工事材料表

INSTALLATION MATERIALS

CU-200

| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | ﾊﾞﾈ座金<br>SPPING WASHER | | M4 SUS304 | | 4 | |
| | | | CODE NO. | 000-864-256 | | |
| 2 | ﾐｶﾞｷ平座金<br>FLAT WASHER | | M4 SUS304 | | 4 | |
| | | | CODE NO. | 000-864-126 | | |
| 3 | 六角ﾅｯﾄ 一種<br>HEX.NUT |  | M4 SUS304 | | 4 | |
| | | | CODE NO. | 000-863-106 | | |
| 4 | 寸切ﾎﾞﾙﾄ<br>THREADED ROD |  | M4X50 SUS304 | | 4 | |
| | | | CODE NO. | 000-147-539 | | |

03G0-X-9403

FURUNO ELECTRIC CO .,LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

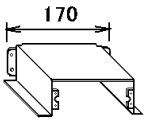
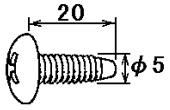
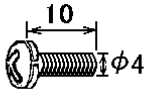
| CODE NO. | 008-539-530 | 03G0-X-9502 -0 |
|---|---|---|
| TYPE | FP03-10201 | 1/1 |

# 付属品表

ACCESSORIES

For CU-200 Desktop mount kit

Option

| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | ﾊﾝｶﾞｰ<br>MOUNTING BRACKET |  | 19-023-3081-0 | | 1 | |
| | | | CODE NO. | 100-316-250 | | |
| 2 | +ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ<br>+TAPPING SCREW |  | 5X20 SUS304 1ｼｭ | | 4 | |
| | | | CODE NO. | 000-802-081 | | |
| 3 | +-ﾅﾍﾞｾﾑｽﾈｼﾞA<br>WASHER HEAD SCREW |  | M4X10 C2700W MBNI2 | | 4 | |
| | | | CODE NO. | 000-881-145 | | |

03G0-X-9502

FURUNO ELECTRIC CO .,LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

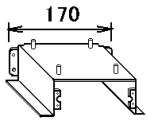
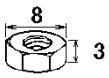
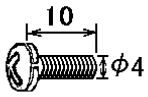
| CODE NO. | 008-539-540 | 03G0-X-9503 -0 |
|---|---|---|
| TYPE | FP03-10202 | 1/1 |

# 付属品表

ACCESSORIES

For CU-200 □
Console mount kit

Option

| 番 号 NO. | 名 称 NAME | 略 図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | ｺﾝｿｰﾙﾖｳ取付材<br>MOUNTING BRACKET |  | 19-023-3091-0 | | 1 | |
| | | | CODE NO. | 100-316-260 | | |
| 2 | ﾊﾞﾈ座金<br>SPPING WASHER | | M4 SUS304 | | 4 | |
| | | | CODE NO. | 000-864-256 | | |
| 3 | ﾐｶﾞｷ平座金<br>FLAT WASHER | | M4 SUS304 | | 4 | |
| | | | CODE NO. | 000-864-126 | | |
| 4 | 六角ﾅｯﾄ 一種<br>HEX.NUT |  | M4 SUS304 | | 4 | |
| | | | CODE NO. | 000-863-106 | | |
| 5 | +-ﾅﾍﾞｾﾑｽﾈｼﾞA<br>WASHER HEAD SCREW |  | M4X10 C2700W MBNI2 | | 4 | |
| | | | CODE NO. | 000-881-145 | | |

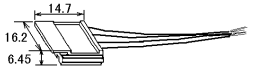
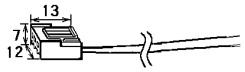
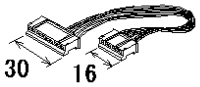
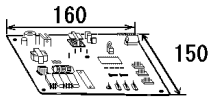
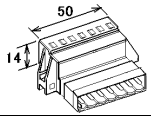
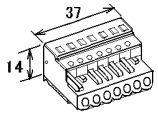
03G0-X-9503

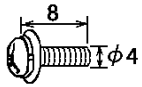
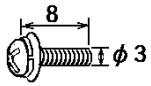
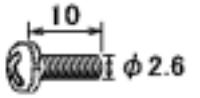
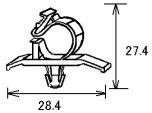
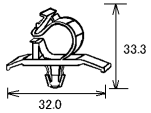
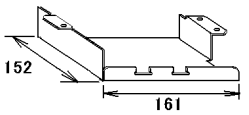
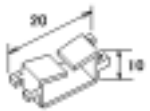
FURUNO ELECTRIC CO .,LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

# PACKING LIST GC-10-2



| NAME | OUTLINE | DESCRIPTION/CODE № | Q'TY |
|---|---|---|---|
| **予備品 SPARE PARTS** | | | |
| 予備品<br>SPARE PARTS | | SP03-13300<br>008-419-280 | 1 |
| **その他部品 OTHER PARTS** | | | |
| NHｺﾈｸﾀ<br>NH CONNECTOR ASSY. |  | 03-2091(5P)<br>008-534-670 | 1 |
| VHｺﾈｸﾀ<br>VH CONNECTOR ASSY. |  | 03-2090(3P)<br>008-534-660 | 1 |
| VHｺﾈｸﾀ<br>VH CONNECTOR ASSY. | | 03-2089(5P)<br>008-534-650 | 1 |
| XH-PHｺﾈｸﾀ<br>XH-PH CONNECTOR ASSY. |  | 03-2088(6-14P)<br>008-534-640 | 1 |
| 演算ﾌﾟﾘﾝﾄ<br>PROCESSOR BOARD |  | 64P1106A<br>004-412-220 | 1 |
| ｺﾈｸﾀ(231)<br>CONNECTOR |  | 231-607/019-FUR<br>000-147-414 | 1 |
| ｺﾈｸﾀ(231)<br>CONNECTOR |  | 231-107/026-FUR<br>000-147-413 | 1 |

| NAME | OUTLINE | DESCRIPTION/CODE № | Q'TY |
|---|---|---|---|
| +-ﾅﾍﾞｾﾑｽﾈｼﾞB<br>WASHER HEAD SCREW |  | M4X8 C2700W MBNI2<br>000-881-445 | 3 |
| +-ﾅﾍﾞｾﾑｽﾈｼﾞB<br>WASHER HEAD SCREW |  | M3X8 C2700W MBNI2<br>000-881-404 | 5 |
| +ﾅﾍﾞｾﾑｽﾈｼﾞA<br>WASHER HEAD SCREW |  | M2.6X10 C2700W MBNI2<br>000-801-844 | 2 |
| ｸﾗﾝﾌﾟ<br>CLAMP |  | CKS-10-L<br>000-106-350 | 2 |
| ｸﾗﾝﾌﾟ<br>CLAMP |  | CKS-13-L<br>000-104-832 | 1 |
| GCｶﾊﾞｰ<br>GC COVER |  | 03-163-8071-2<br>100-305-682 | 1 |
| ｴｯｼﾞｻﾄﾞﾙ<br>CLAMP |  | EDS-1<br>000-570-299 | 2 |

A-23

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

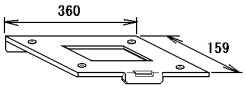
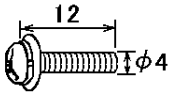
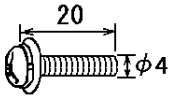
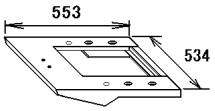
| CODE NO. | 008-535-640 | 03GL-X-9408 -3 |
|---|---|---|
| TYPE | OP03-183 | 1/1 |

# 工事材料表

INSTALLATION MATERIALS

Coupling pedestal kit □
RCU-014 + MU-201CR

Option

| 番 号 NO. | 名 称 NAME | 略 図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | 連結金具B<br>COUPLING FIXTURE |  | 03-163-7604-0 | | 1 | RCU-014,MU-201CR用<br>FOR RCU-014 AND MU-201CR |
| | | | CODE NO. | 100-308-270 | | |
| 2 | +-ﾅﾍﾞ ｾﾑｽﾈｼﾞ B<br>WASHER HEAD SCREW |  | M4X12 C2700W MBNI2 | | 4 | RCU-014,MU-201CR用<br>FOR RCU-014 AND MU-201CR |
| | | | CODE NO. | 000-881-447 | | |
| 3 | +-ﾅﾍﾞ ｾﾑｽﾈｼﾞ B<br>WASHER HEAD SCREW |  | M4X20 C2700W MBNI2 | | 2 | RCU-014,MU-201CR用<br>FOR RCU-014 AND MU-201CR |
| | | | CODE NO. | 000-881-451 | | |
| 4 | 連結台(20)組品<br>COUPLING PLATE ASSY. |  | OP03-183-1 | | 1 | RCU-014,MU-201CR用<br>FOR RCU-014 AND MU-201CR |
| | | | CODE NO. | 008-536-980 | | |



FURUNO ELECTRIC CO .,LTD.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

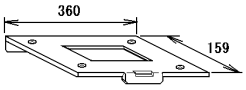
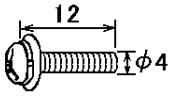
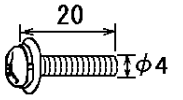
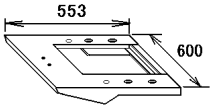
| CODE NO. | 008-535-650 | 03GL-X-9409 -3 |
|---|---|---|
| TYPE | OP03-184 | 1/1 |

# 工事材料表

INSTALLATION MATERIALS

Coupling pedestal kit □
RCU-014 + MU-231CR

Option

| 番 号 NO. | 名 称 NAME | 略 図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | 連結金具B<br>COUPLING FIXTURE |  | 03-163-7604-0 | | 1 | RCU-014,MU-231CR用<br>FOR RCU-014 AND MU-231CR |
| | | | CODE NO. | 100-308-270 | | |
| 2 | +-ﾅﾍﾞｾﾑｽﾈｼﾞB<br>WASHER HEAD SCREW |  | M4X12 C2700W MBNI2 | | 4 | RCU-014,MU-231CR用<br>FOR RCU-014 AND MU-231CR |
| | | | CODE NO. | 000-881-447 | | |
| 3 | +-ﾅﾍﾞｾﾑｽﾈｼﾞB<br>WASHER HEAD SCREW |  | M4X20 C2700W MBNI2 | | 2 | RCU-014,MU-231CR用<br>FOR RCU-014 AND MU-231CR |
| | | | CODE NO. | 000-881-451 | | |
| 4 | 連結台(23)組品<br>COUPLING PLATE ASSY. |  | OP03-184-1 | | 1 | RCU-014,MU-231CR用<br>FOR RCU-014 AND MU-231CR |
| | | | CODE NO. | 008-536-990 | | |

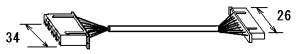
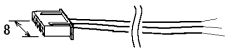
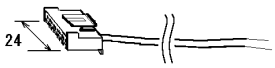
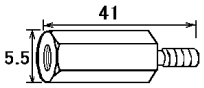
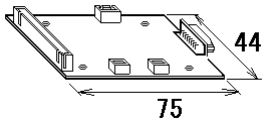
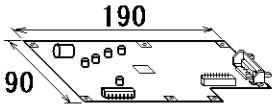
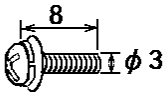
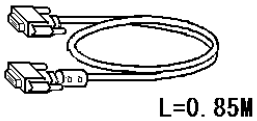
03GL-X-9409

FURUNO ELECTRIC CO .,LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

# PACKING LIST

**0P03-180** DVI-RGB conversion kit Option

| NAME | OUTLINE | DESCRIPTION/CODE Nº | Q'TY |
|---|---|---|---|
| **その他部品 OTHER PARTS** | | | |
| ﾊﾞﾈｻﾞｶﾞﾈ<br>SPRING WASHER | | M3 C5191W MBNI2<br>000-864-204 | 6 |
| XHｺﾈｸﾀ組品<br>XH CONNECTOR ASSY. |  | 03-2094(13-10P)<br>008-534-710 | 1 |
| XHｺﾈｸﾀ組品<br>XH CONNECTOR ASSY. |  | 03-2093(3P)<br>008-534-700 | 1 |
| VHｺﾈｸﾀ組品<br>VH CONNECTOR ASSY. |  | 03-2092(6P)<br>008-534-690 | 1 |
| ｽﾍﾟｰｻｰ<br>SPACER |  | SQ-35<br>000-801-651 | 6 |
| RGB-BUFFﾌﾟﾘﾝﾄ<br>RGB-BUFF BOARD |  | 03P9229B<br>008-514-980 | 1 |
| DVI-RGB組品<br>DVI-RGB ASSY. |  | 80-0667<br>008-537-660 | 1 |
| +-ﾅﾍﾞｾﾑｽﾈｼﾞB<br>WASHER HEAD SCREW |  | M3X8 C2700W MBNI2<br>000-881-404 | 10 |
| ｹｰﾌﾞﾙ組品<br>CABLE ASSY. |  | DVI-D/D S-LINK 0.85M<br>000-148-644 | 1 |

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

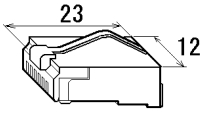
FURUNO

| CODE NO. | 008-536-810 | 03GL-X-9407 -2 |
|---|---|---|
| TYPE | OP03-187 | 1/1 |

# 工事材料表
INSTALLATION MATERIALS

For LAN cable kit

Option

| 番号 NO. | 名称 NAME | 略図 OUTLINE | 型名／規格 DESCRIPTIONS | | 数量 Q'TY | 用途／備考 REMARKS |
|---|---|---|---|---|---|---|
| 1 | ｺﾈｸﾀ(ﾓｼﾞｭﾗｰ)<br>MODULAR CONNCTOR |  | MPS588-C | | 2 | |
| | | | CODE NO. | 000-148-322 | | |

03GL-X-9407

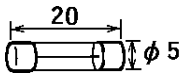
FURUNO ELECTRIC CO ., LTD.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

| CODE NO. | 008-535-990 | 03GL-X-9303 -0 1/1 |
|---|---|---|
| TYPE | SP03-14401 | BOX NO. P |

| SHIP NO. | SPARE PARTS LIST FOR | U S E | SETS PER VESSEL |
|---|---|---|---|
| | | MU-201CR AC set□<br>MU-231CR AC set | |

| ITEM NO. | NAME OF PART | OUTLINE | DWG. NO. OR TYPE NO. | QUANTITY | | | REMARKS/CODE NO. |
|---|---|---|---|---|---|---|---|
| | | | | WORKING | | SPARE | |
| | | | | PER SET | PER VES | | |
| 1 | ﾋｭｰｽﾞ<br>FUSE |  | FGMB 2A 250V | | | 2 | 表示部用<br>FOR DISPLAY UNIT<br>000-122-000 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

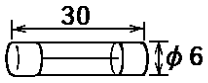
| MFR'S NAME | FURUNO ELECTRIC CO.,LTD. | DWG NO. | 03GL-X-9303 | 1/1 |
|---|---|---|---|---|

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

| CODE NO. | 008-535-910 | 03GL-X-9305 -0 1/1 |
|---|---|---|
| TYPE | SP03-14404 | BOX NO. P |

| SHIP NO. | SPARE PARTS LIST FOR | U S E | SETS PER VESSEL |
|---|---|---|---|
| | | RPU-013 □<br>100 VAC set | |

| ITEM NO. | NAME OF PART | OUTLINE | DWG. NO. OR TYPE NO. | QUANTITY WORKING PER SET | QUANTITY WORKING PER VES | QUANTITY SPARE | REMARKS/CODE NO. |
|---|---|---|---|---|---|---|---|
| 1 | ﾋｭｰｽﾞ<br>FUSE |  | FGB0 10A<br>AC125V | | | 4 | AC100用<br>制御部用<br>FOR PROCESSOR UNIT<br>000-549-065 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

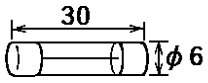
| MFR'S NAME | FURUNO ELECTRIC CO.,LTD. | DWG NO. | 03GL-X-9305 | 1/1 |
|---|---|---|---|---|

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

| CODE NO. | 008-535-920 | 03GL-X-9306 -0 1/1 |
|---|---|---|
| TYPE | SP03-14405 | BOX NO. P |

| SHIP NO. | SPARE PARTS LIST FOR | U S E | SETS PER VESSEL |
|---|---|---|---|
| | | RPU-013 □<br>220 VAC set□ | |

| ITEM NO. | NAME OF PART | OUTLINE | DWG. NO. OR TYPE NO. | QUANTITY WORKING PER SET | QUANTITY WORKING PER VES | QUANTITY SPARE | REMARKS/CODE NO. |
|---|---|---|---|---|---|---|---|
| 1 | ﾋｭｰｽﾞ<br>FUSE |  | FGB0 5A<br>AC250V | | | 4 | AC220用<br>制御部用<br>FOR PROCESSOR UNIT<br>000-549-022 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

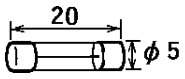
| MFR'S NAME | FURUNO ELECTRIC CO.,LTD. | DWG NO. | 03GL-X-9306 | 1/1 |
|---|---|---|---|---|

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

| CODE NO. | 008-419-280 | 03GL-X-9302 -0 1/1 |
|---|---|---|
| TYPE | SP03-13300 | BOX NO. P |

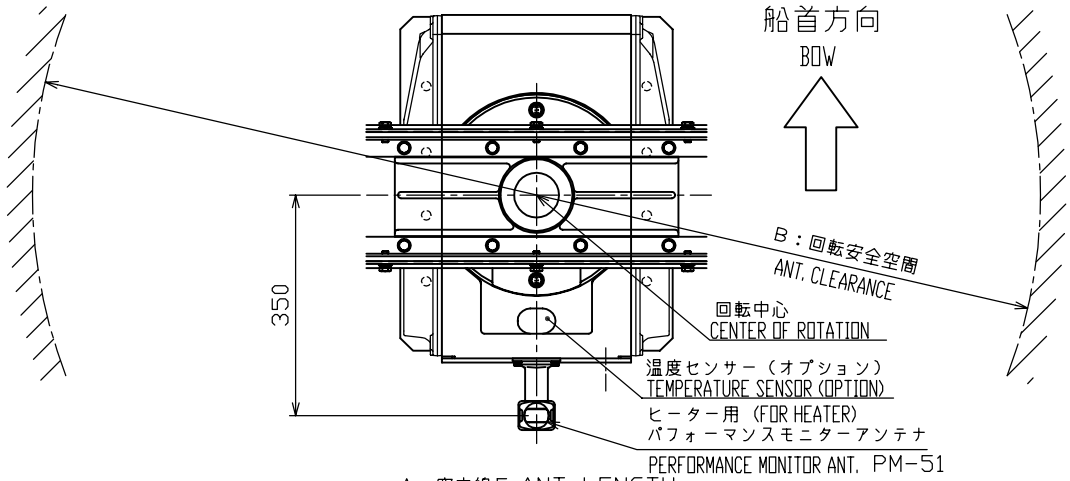
| SHIP NO. | SPARE PARTS LIST FOR | U S E | SETS PER VESSEL |
|---|---|---|---|
| | | GC-10 | |

| ITEM NO. | NAME OF PART | OUTLINE | DWG. NO. OR TYPE NO. | QUANTITY | | | REMARKS/CODE NO. |
|---|---|---|---|---|---|---|---|
| | | | | WORKING | | SPARE | |
| | | | | PER SET | PER VES | | |
| 1 | ﾋｭｰｽﾞ<br>FUSE |  | FGMB 2A 250V | | | 8 | ｼﾞｬｲﾛｺﾝﾊﾞｰﾀｰ用<br>FOR GYRO CONVERTER<br>000-122-000 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| MFR'S NAME | FURUNO ELECTRIC CO.,LTD. | DWG NO. | 03GL-X-9302 | 1/1 |
|---|---|---|---|---|

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO



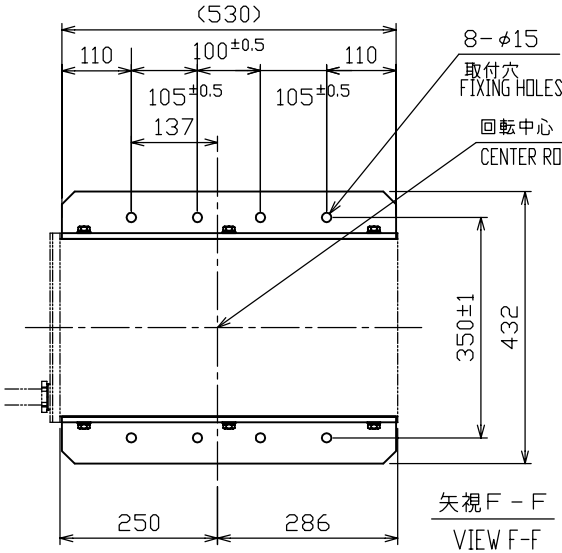
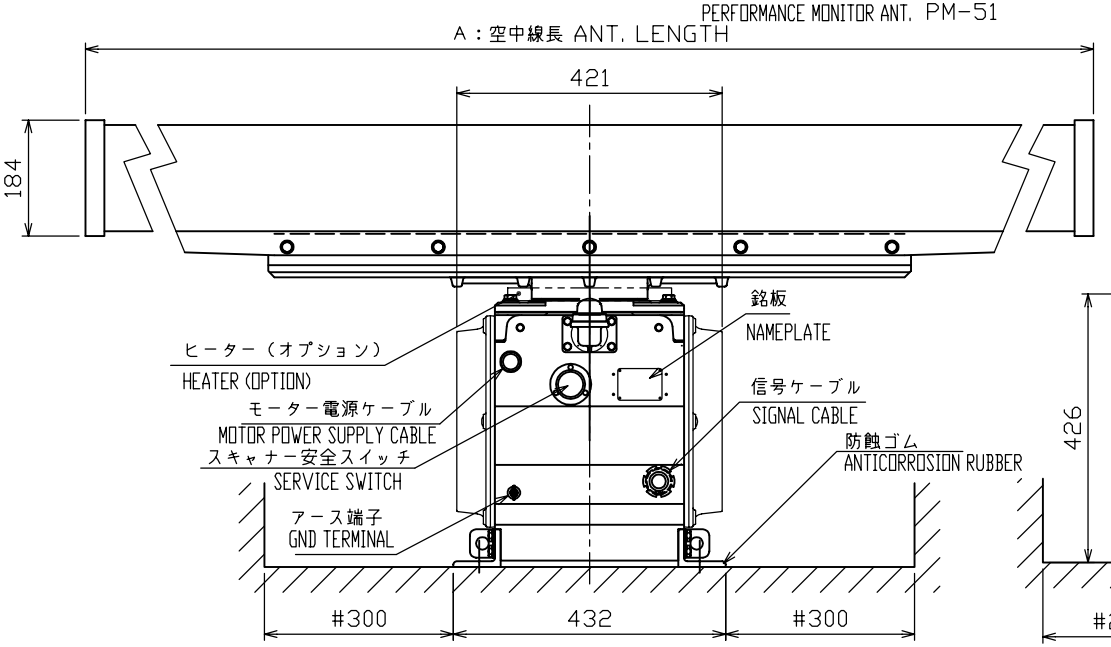



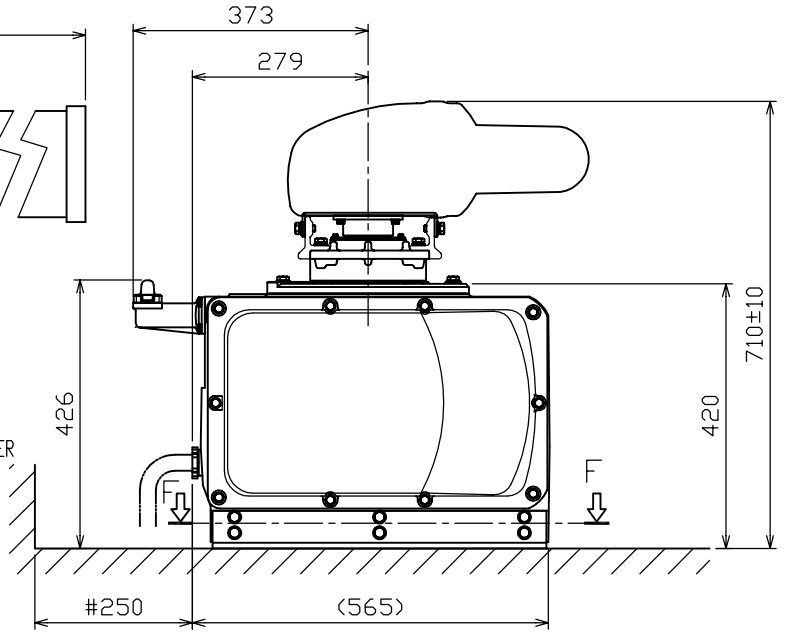

表 1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |
| 500<L≦1000 | ±4 |
| 1000<L≦2000 | ±5 |
| 2000<L≦4000 | ±7 |

表 2 TABLE 2

| アンテナ型式 ANT. TYPE | SN36AF | SN30AF |
|---|---|---|
| A：空中線長 ANT. LENGTH | 3765±10mm | 3090±10mm |
| B：回転安全空間 CLEARANCE | 3860mm | 3200mm |
| 質量 MASS | 142kg | 135kg |




注　記

1）　#印寸法は最小サービス空間寸法とする。
2）　A，B寸法、及び質量は表2による。
3）　指定外の寸法公差は表1による。
4）　取付用ネジはM12ボルトを使用のこと。

NOTE

1. #: MINIMUM SERVICE CLEARANCE.
2. SEE TABLE 2 FOR DIMENSIONS OF A, B AND MASS.
3. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
4. USE M12 BOLTS FOR FIXING THE UNIT.

| | | | |
|---|---|---|---|
| DRAWN | Apr. 28 '04 E.MIYOSHI | | TITLE RSB-098/099/100/101/102 |
| CHECKED | TAKAHASHI. T | | 名称 空中線部 |
| APPROVED | Y. Hatai | FAR-2137S/2837S | 外寸図 |
| SCALE | 1/12 | MASS 表2参照 SEE TABLE 2 | NAME ANTENNA UNIT |
| DWG.No. | C3526-G01- B | 03-163-300G-5 | OUTLINE DRAWING |

FURUNO ELECTRIC CO., LTD.

FURUNO

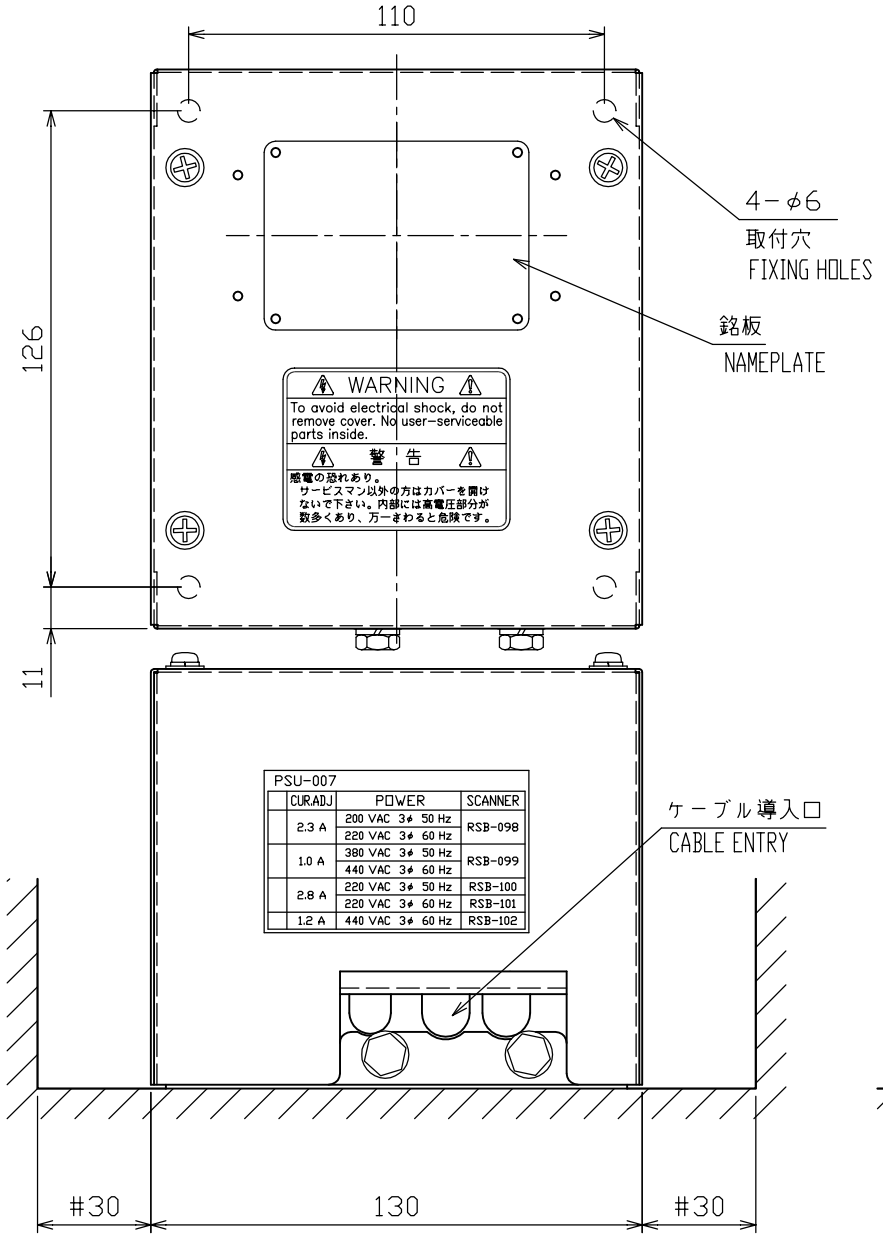
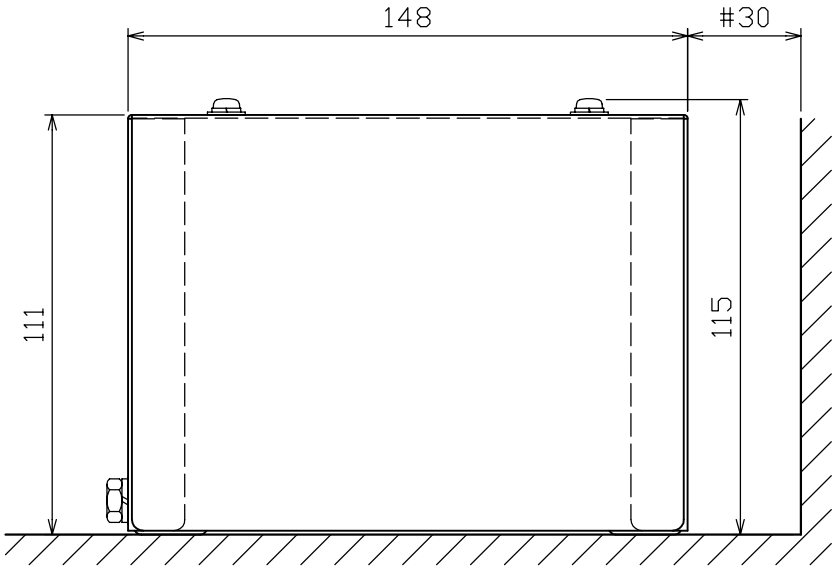



表 1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1．5 |
| 50<L≦100 | ±2．5 |
| 100<L≦500 | ±3 |

注　記　1）＃印寸法は最小サービス空間寸法とする。
2）指定外の寸法公差は表 1 による。
3）取付にはトラスタッピンネジ呼び径５×２０を使用のこと。

NOTE　1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE SELF-TAPPING SCREWS 5X20 FOR FIXING THE UNIT.

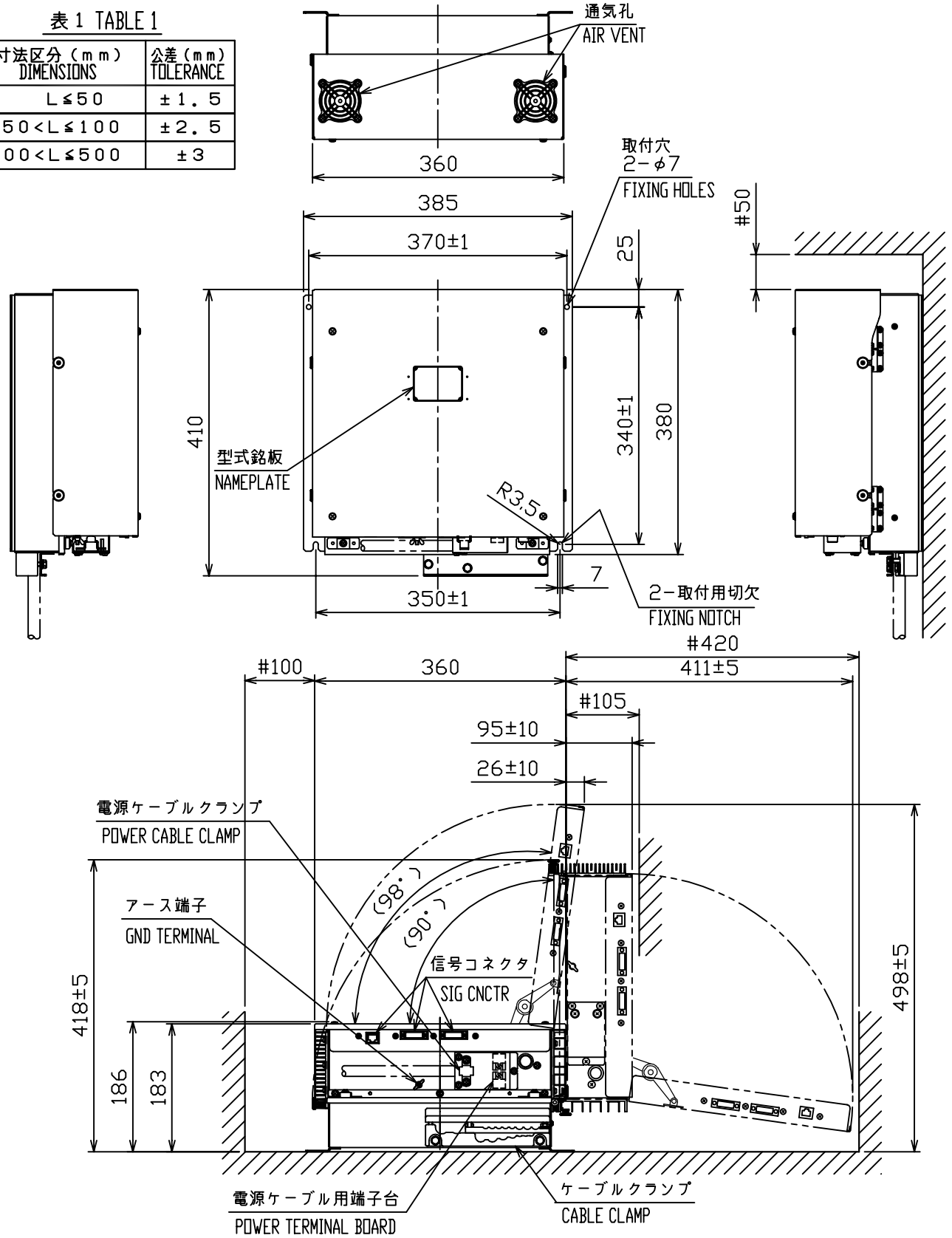



| | | | |
|---|---|---|---|
| DRAWN Apr. 28 '04 E. MIYOSHI | | | TITLE PSU-007 |
| CHECKED TAKAHASHI. T | | | 名称 電源制御部 |
| APPROVED Y. Hatai | | FAR-2137S/2837S | 外寸図 |
| SCALE 1/2 | MASS 0.9 ±10% kg | | NAME POWER SUPPLY UNIT |
| DWG No. C3521-G01- B | | 03-163-330G-1 | OUTLINE DRAWING |

FURUNO ELECTRIC CO., LTD.

表 1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |

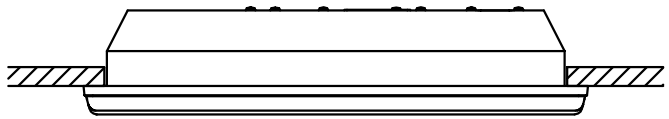


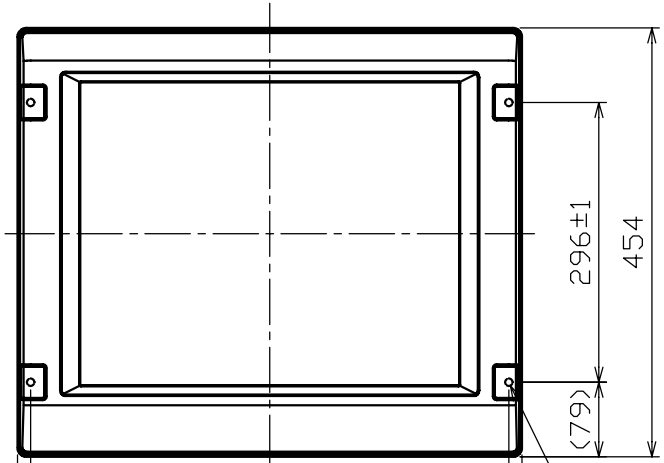

注　記　1）　#印寸法は最小サービス空間寸法とする。
2）　指定外の寸法公差は表１による。
3）　取付けはＭ６ボルト、またはコーチボルト
呼び径６を使用のこと。

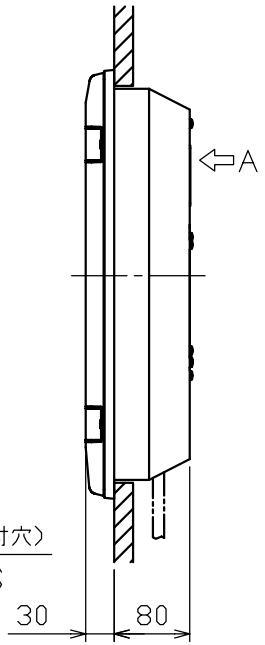
NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M6 BOLTS OR COACH SCREWS φ6 FOR FIXING THE UNIT.

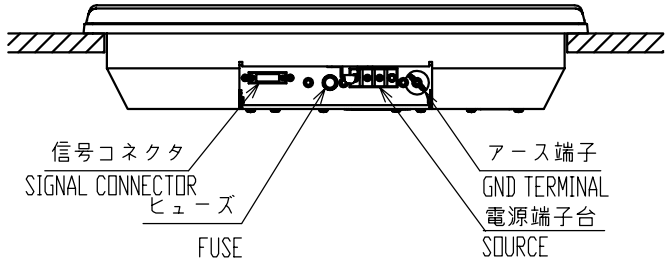
| | | | |
|---|---|---|---|
| DRAWN Nov 17 '03 E. MIYOSHI | | | TITLE RPU-013 |
| CHECKED Takahashi T. | | | 名称 制御部 |
| APPROVED Y. Hatai | | FAR-2117/2817 SER. | 外寸図 |
| SCALE 1/8 | MASS 10 ±10% kg | | NAME PROCESSOR UNIT |
| DWG.No. C3519-G03- C | | 03-163-800G-2 | OUTLINE DRAWING |

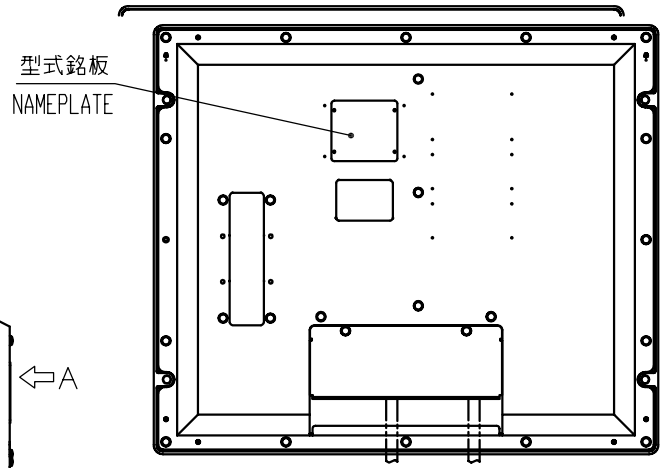
FURUNO





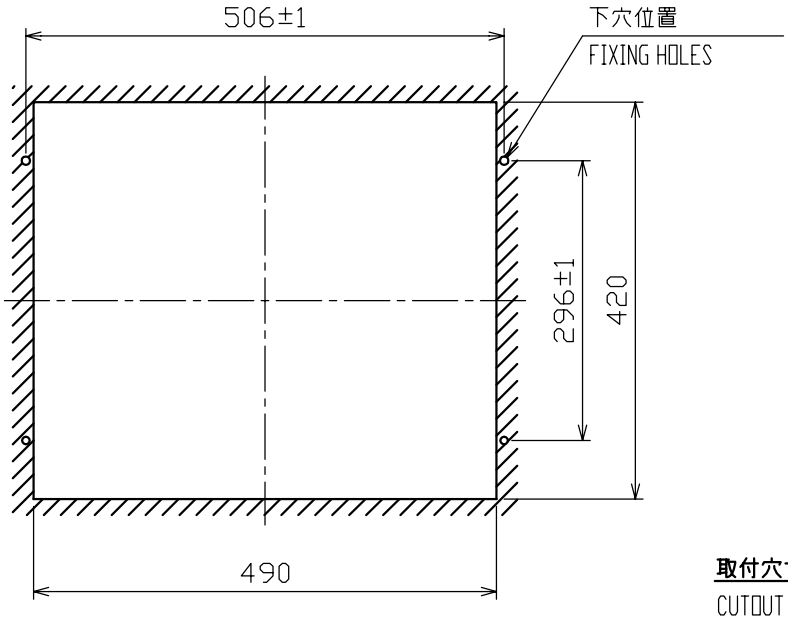




矢視A VIEW A

表1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |
| 500<L≦1000 | ±4 |




取付穴寸法図
CUTOUT DIMENTIONS

注　記　1）指定外の寸法公差は表1による。
　　2）取付には＋トラスタッピンネジ6×30を使用のこと。

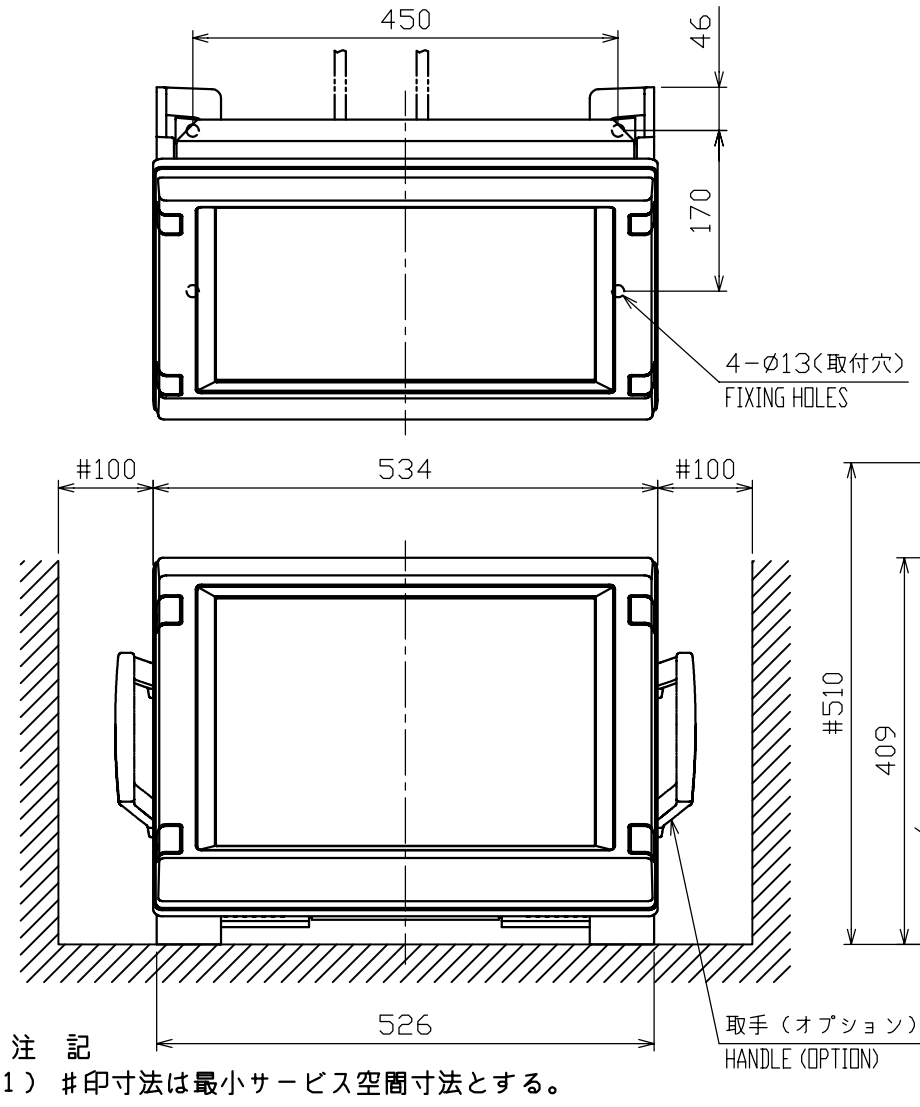
NOTE　1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2. USE TAPPING SCREWS 6x30 FOR FIXING THE UNIT.

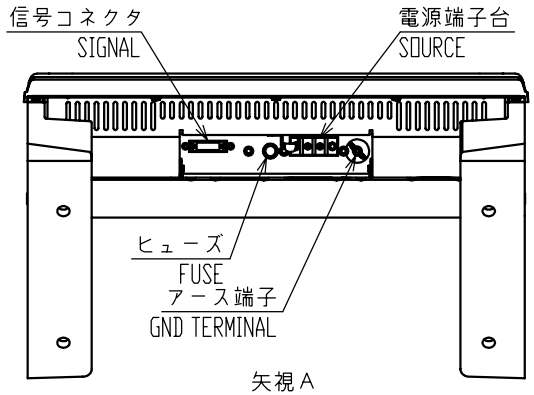
| | | | |
|---|---|---|---|
| DRAWN | Nov. 25 '03 E. MIYOSHI | | TITLE MU-201CR |
| CHECKED | Takahashi T. | | 名称 表示部（埋込装備） |
| APPROVED | Y. Hatai | FAR-2117 SER. | 外寸図 |
| SCALE | 1/8 | MASS 11.0 ±10% kg | NAME MONITOR UNIT (FLUSH MOUNT) |
| DWG.No. | C3519-G05- B | 03-163-110G-2 | OUTLINE DRAWING |

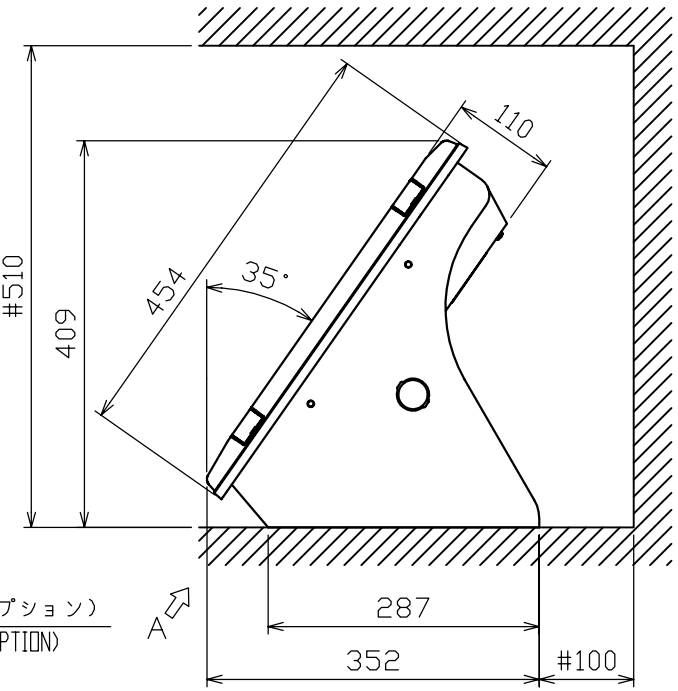


FURUNO ELECTRIC CO., LTD.

FURUNO



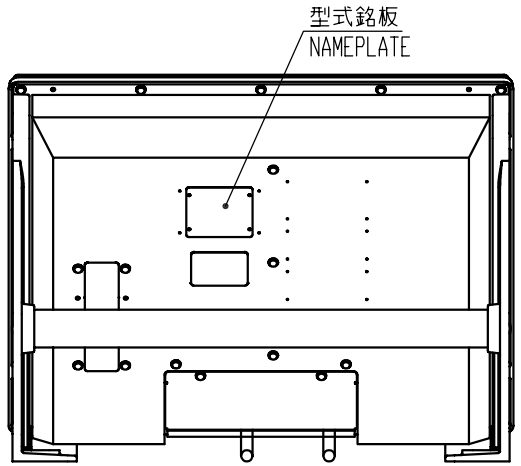




表1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |
| 500<L≦1000 | ±4 |

注　記

1）＃印寸法は最小サービス空間寸法とする。
2）指定外の寸法公差は表1による。
3）取付にはM10ボルトまたはコーチボルト呼び径9を使用のこと。

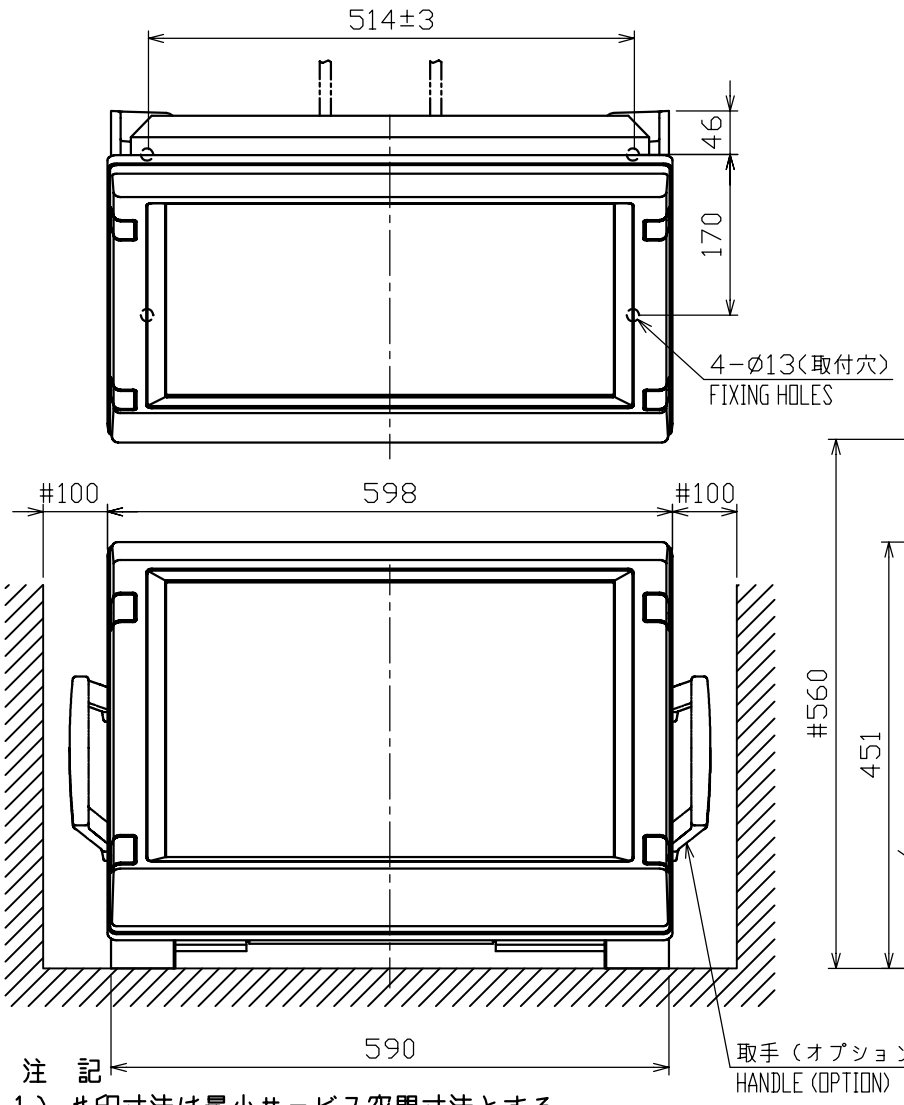
NOTE

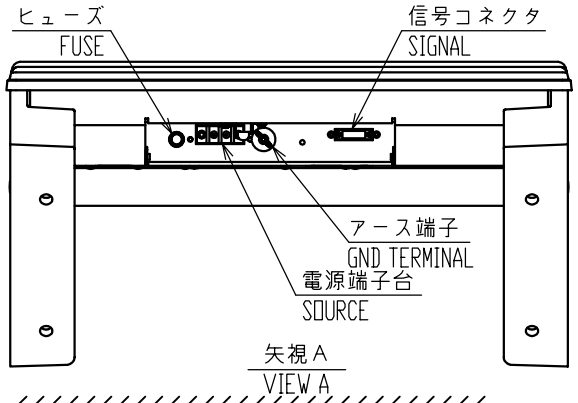
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M10 BOLTS OR COACH SCREWS ø9 FOR FIXING THE UNIT.

| | | | |
|---|---|---|---|
| DRAWN Jan. 7 '04 E. MIYOSHI | | TITLE | MU-201CR |
| CHECKED Takahashi T. | | 名称 | 表示部（卓上装備） |
| APPROVED Y. Hatai | FAR-2117 SER. | | 外寸図 |
| SCALE 1/8 MASS 17.0 ±10% kg | | NAME | MONITOR UNIT (DESKTOP MOUNT) |
| DWG.No. C3519-G04- B | 03-163-100G-2 | | OUTLINE DRAWING |

FURUNO ELECTRIC CO., LTD.

FURUNO




矢視A
VIEW A

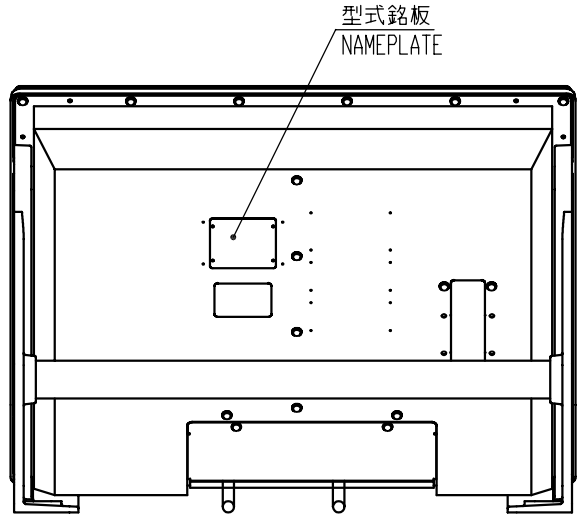



表1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |
| 500<L≦1000 | ±4 |

注　記

1）＃印寸法は最小サービス空間寸法とする。
2）指定外の寸法公差は表1による。
3）取付にはM10ボルトまたはコーチボルト呼び径9を使用のこと。

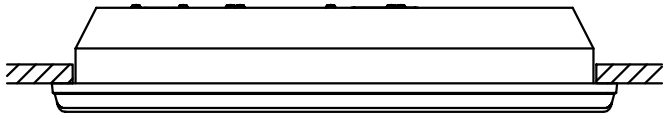
NOTE

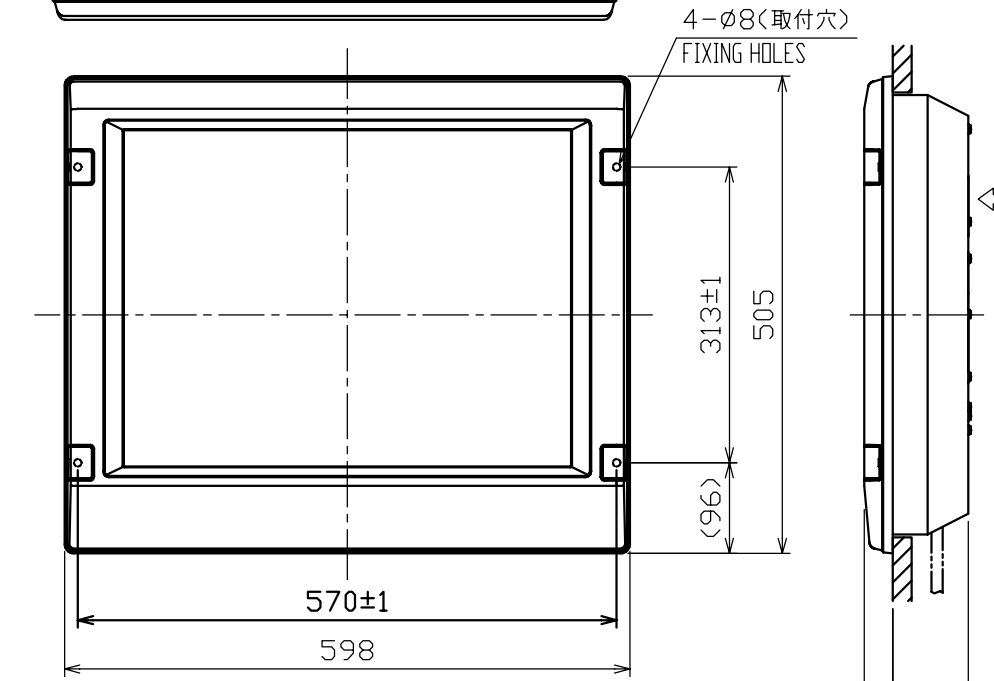
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M10 BOLTS OR COACH SCREWS ø9 FOR FIXING THE UNIT.

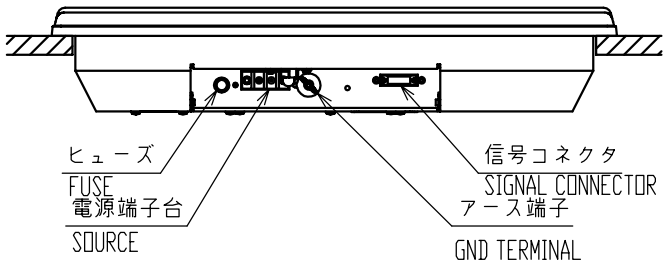
| | | | |
|---|---|---|---|
| DRAWN Jan. 7 '04 E. MIYOSHI | | | TITLE MU-231CR |
| CHECKED Takahashi T. | | | 名称 表示部（卓上装備） |
| APPROVED Y. Hatai | | FAR-2817 SER. | 外寸図 |
| SCALE 1/8 | MASS 22 ±10% kg | | NAME MONITOR UNIT (DESKTOP MOUNT) |
| DWG.No. C3524-G01- B | | 03-163-200G-2 | OUTLINE DRAWING |

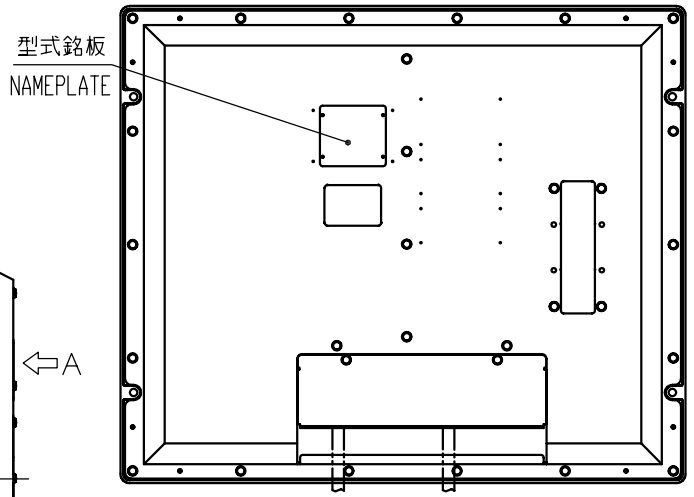
FURUNO ELECTRIC CO., LTD.

FURUNO

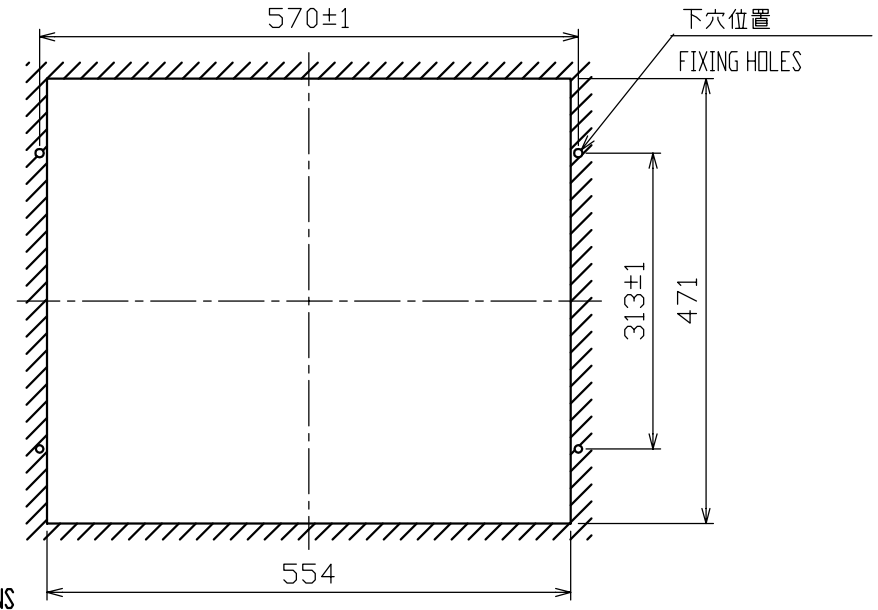





矢視A
VIEW A




取付穴寸法図
CUTOUT DIMENSIONS

表1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |
| 500<L≦1000 | ±4 |

注　記　1）指定外の寸法公差は表1による。
　　2）取付には＋トラスタッピンネジ６Ｘ３０を使用のこと。

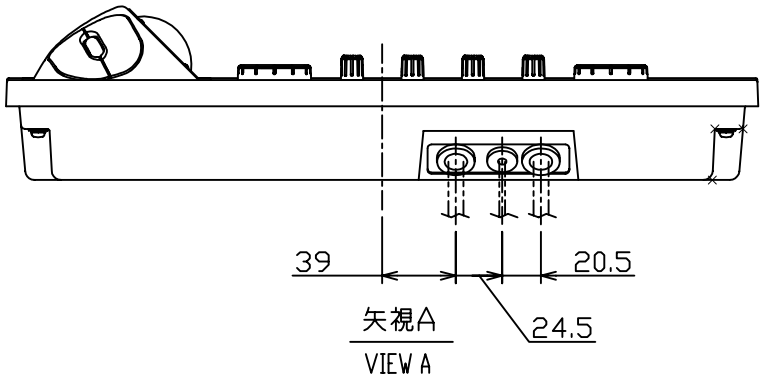
NOTE　1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2. USE TAPPING SCREWS 6x30 FOR FIXING THE UNIT.

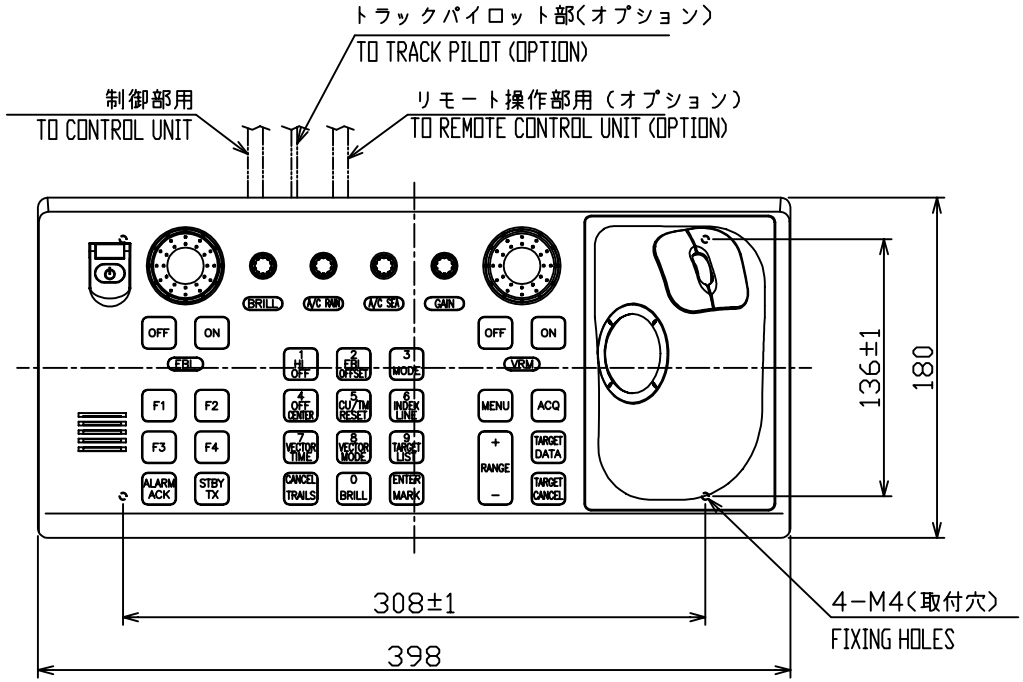
| | | | |
|---|---|---|---|
| DRAWN | Nov. 26 '03 E. MIYOSHI | | TITLE MU-231CR |
| CHECKED | Takahashi T. | | 名称 表示部（埋込装備） |
| APPROVED | Y. Hatai | FAR-2817 SER. | 外寸図 |
| SCALE | 1/8 | MASS 15.0 ±10% kg | NAME MONITOR UNIT (FLUSH MOUNT) |
| DWG.No. | C3524-G02- B | 03-163-210G-2 | OUTLINE DRAWING |

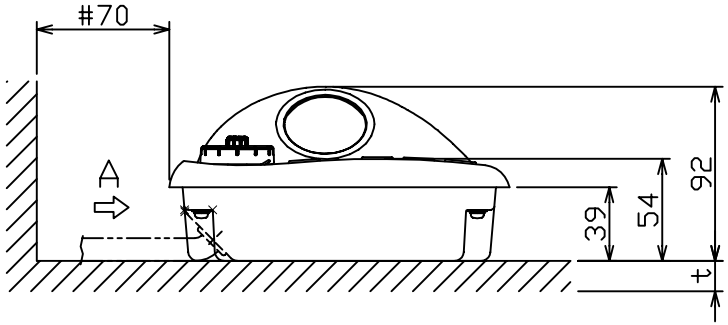


FURUNO ELECTRIC CO., LTD.

FURUNO




注　記　1）　#印寸法は最小サービス空間寸法とする。
　　2）　指定外の寸法公差は表1による。
　　3）　取付用ネジはセムスB（M4X（t+4））を使用のこと。
　　4）　質量はケーブル（10m)を含む

NOTE　1.　#: MINIMUM SERVICE CLEARANCE.
　　2.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　3.　USE SEMS SCREWS M4x(t+4) FOR FIXING THE UNIT.
　　4.　MASS IN CLUDES CABLE (10M).

表1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |

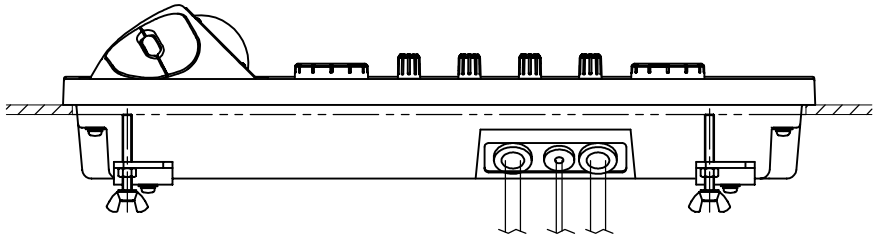
| | | | |
|---|---|---|---|
| DRAWN | Jan. 26 '03 E. MIYOSHI | | TITLE RCU-014 |
| CHECKED | Takahashi T. | | 名称 操作部 |
| APPROVED | Y. Hatai | FAR-2117/2817 SER. | 外寸図 |
| SCALE | 1/4 | MASS 3.7 ±10% kg | NAME CONTROL UNIT |
| DWG.No. | C3519-G06- C | 03-163-750G-3 | OUTLINE DRAWING |

FURUNO ELECTRIC CO., LTD.

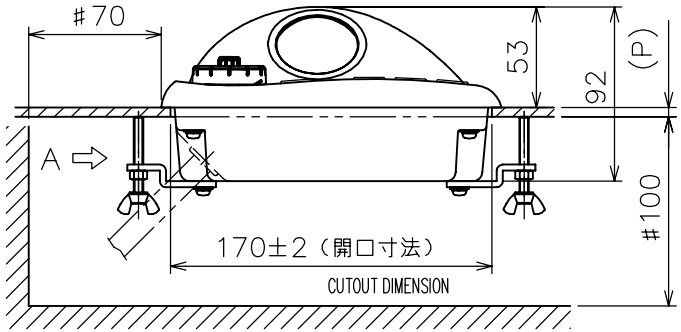
FURUNO

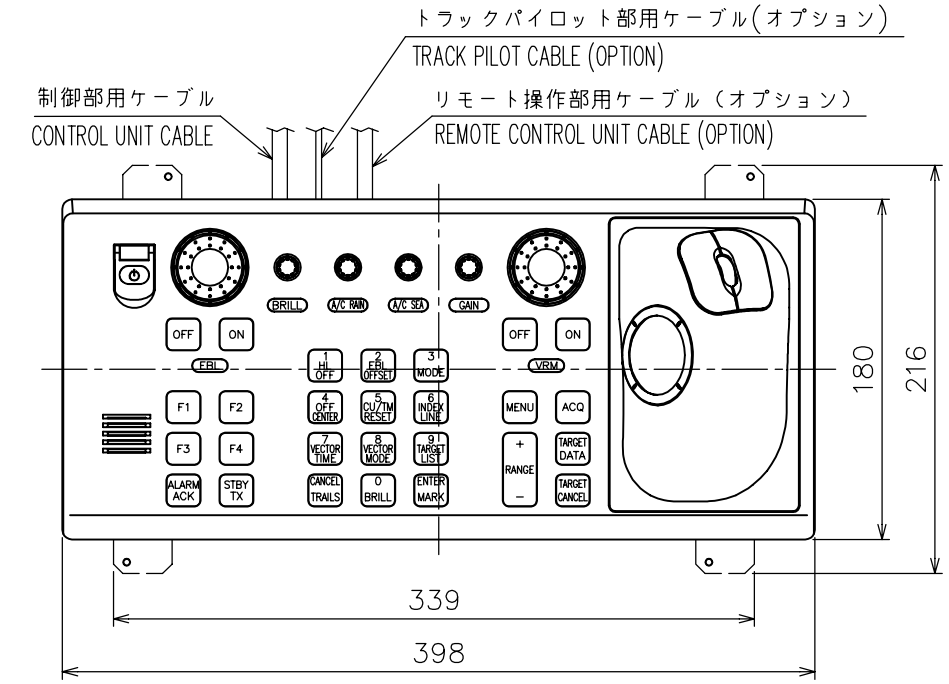
表１ TABLE 1

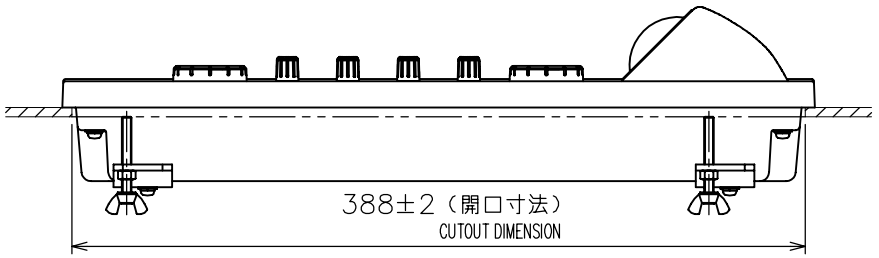
| 寸法区分（ｍｍ） DIMENSIONS | 公差（ｍｍ） TOLERANCE |
|---|---|
| L≦50 | ±1．5 |
| 50<L≦100 | ±2．5 |
| 100<L≦500 | ±3 |



矢視 A
VIEW A




NOTE
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. MASS INCLUDES CABLE (10M).
4. THICKNESS (P) 20 MM MAX.

注　記　１）＃印寸法は最小サービス空間寸法とする。
２）指定外の寸法公差は表１による。
３）質量はケーブル（１０ｍ）を含む
４）壁の厚さ（Ｐ）は最大２０とする

| | | | |
|---|---|---|---|
| DRAWN | Mar. 17 '04 E. MIYOSHI | | TITLE RCU-014 |
| CHECKED | TAKAHASHI.T | | 名称 操作部（埋込装備） |
| APPROVED | Y. Hatai | FAR-2817 SER. | 外寸図 |
| SCALE | 1/4 | MASS 3.8 ±10% kg | NAME CONTROL UNIT (FLUSH MOUNT) |
| DWG.No. | C3524-G04- C | 03-163-751G-2 | OUTLINE DRAWING |

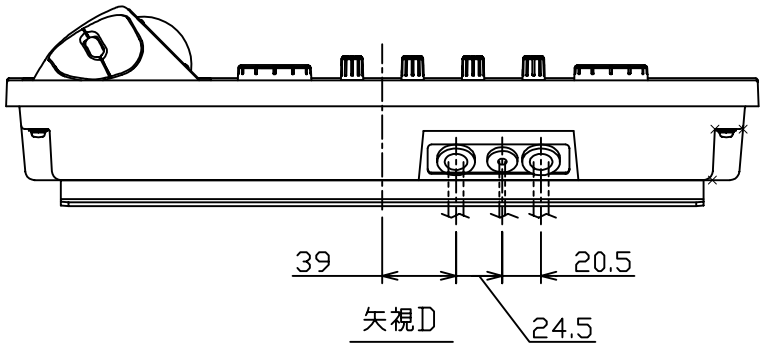


FURUNO ELECTRIC CO., LTD.

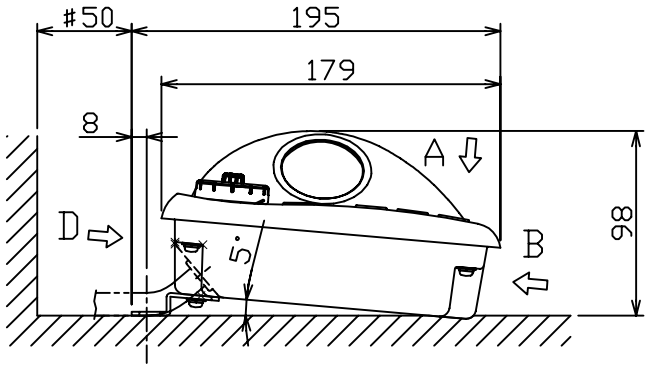
FURUNO

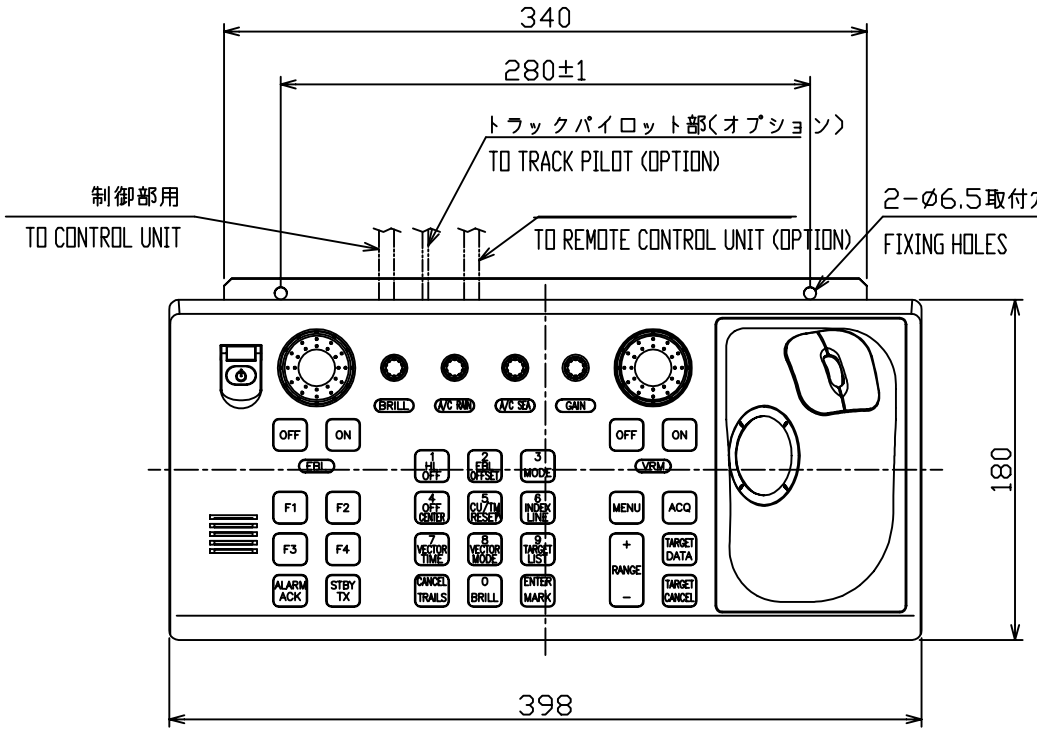
表１ TABLE 1

| 寸法区分（ｍｍ） DIMENSIONS | 公差（ｍｍ） TOLERANCE |
|---|---|
| Ｌ≦５０ | ±１．５ |
| ５０<Ｌ≦１００ | ±２．５ |
| １００<Ｌ≦５００ | ±３ |

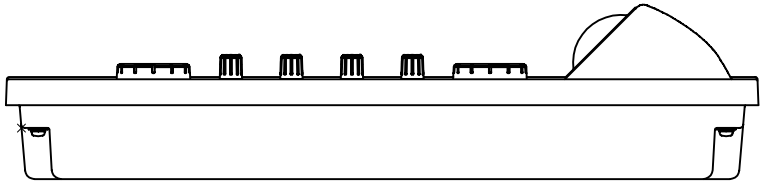



矢視Ｄ
VIEW D




矢視Ａ VIEW A



矢視Ｂ VIEW B

NOTE
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE TAPPING SCREWS (ø6) OR M6 BOLTS FOR FIXING.
4. MASS INCLUDES CABLE (10M).

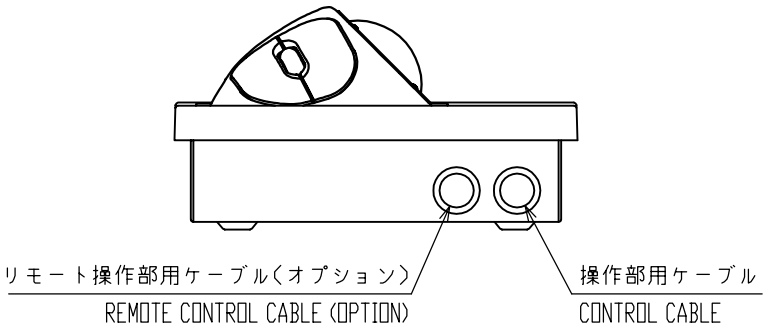
注　記　１）＃印寸法は最小サービス空間寸法とする。
２）指定外の寸法公差は表１による。
３）取付用ネジはトラスタッピンネジ呼び径６、またはＭ６ボルトを使用のこと
４）質量はケーブル（１０ｍ）を含む

| | | | |
|---|---|---|---|
| DRAWN | Jan. 7 '04 E. MIYOSHI | | TITLE RCU-014 |
| CHECKED | Takahashi T. | | 名称 操作部（直付金具装備） |
| APPROVED | Y. Hatai | FAR-2817 SER. | 外寸図 |
| SCALE | 1/4 | MASS 4.0 ±10% kg | NAME CONTROL UNIT (DESKTOP W/KB PLATE) |
| DWG.No. | C3524-G05- B | 03-163-752G-1 | OUTLINE DRAWING |

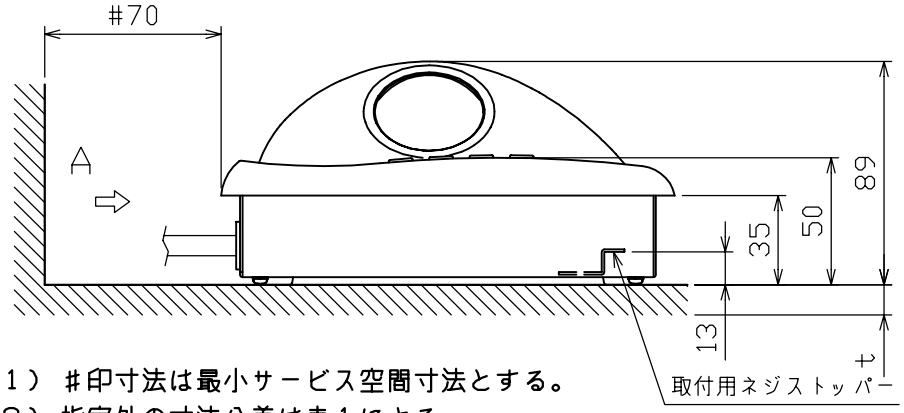


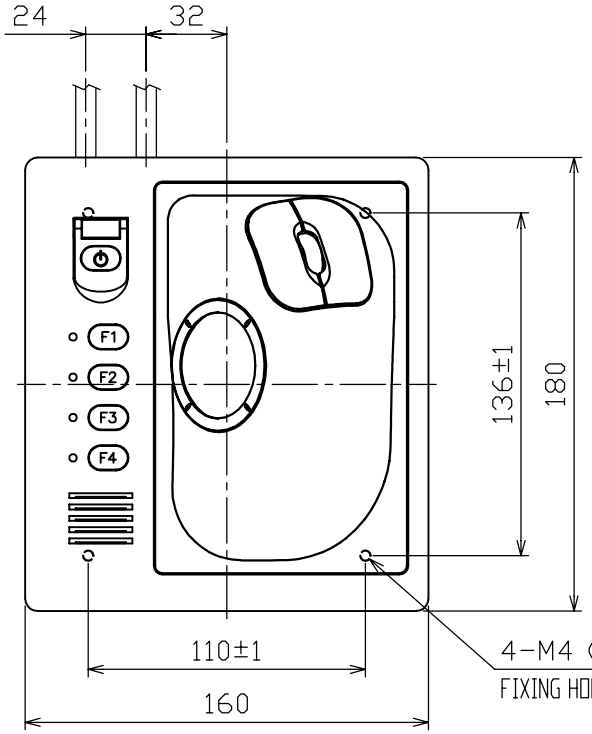
FURUNO ELECTRIC CO., LTD.

FURUNO




矢視A
VIEW A



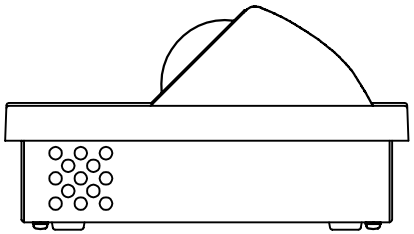



表1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |

NOTE

1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M4x12 SCREWS FOR FIXING.
   THICKNESS OF MOUNTING SURFACE SHOULD BE 2.5 CM.
   FOR GREATOR THICKNESS USE SCREW
   WHOSE LINGTH IS (M4X(t+7.8)) ±2.
4. MASS INCLUDES CABLE (10).

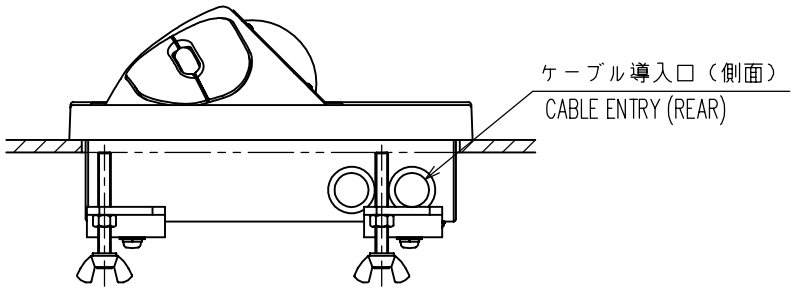
注　記　1）＃印寸法は最小サービス空間寸法とする。
　　2）指定外の寸法公差は表１による。
　　3）取付用ネジはセムスB（M4X12）を使用のこと。
　　取付面板厚は最小2最大5とする。
　　それ以外はネジ長さ（M4X（t+7.8））±2
　　のセムスBを使用のこと。
　　4）質量はケーブル（10m）を含む

| | | | |
|---|---|---|---|
| DRAWN | Jan. 7 '04 E. MIYOSHI | | TITLE RCU-015 |
| CHECKED | Takahashi T. | | 名称 操作部（卓上装備） |
| APPROVED | Y. Hatai | FAR-2117 SER. | 外寸図 |
| SCALE 1/3 | MASS 2.4 ±10% kg | 質量は10mケーブル重さを含む。 MASS W/ 10m CABLE | NAME CONTROL UNIT (DESKTOP MOUNT) |
| DWG.No. | C3519-G13- B | 03-163-785G-2 | OUTLINE DRAWING |



FURUNO ELECTRIC CO., LTD.

FURUNO




矢視 A
VIEW A

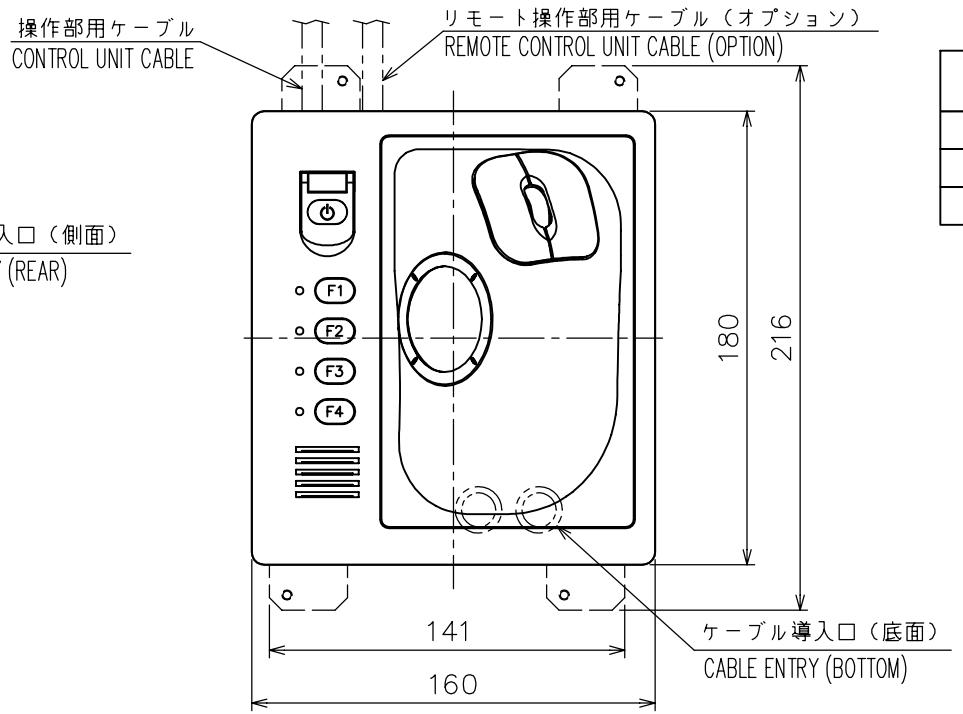
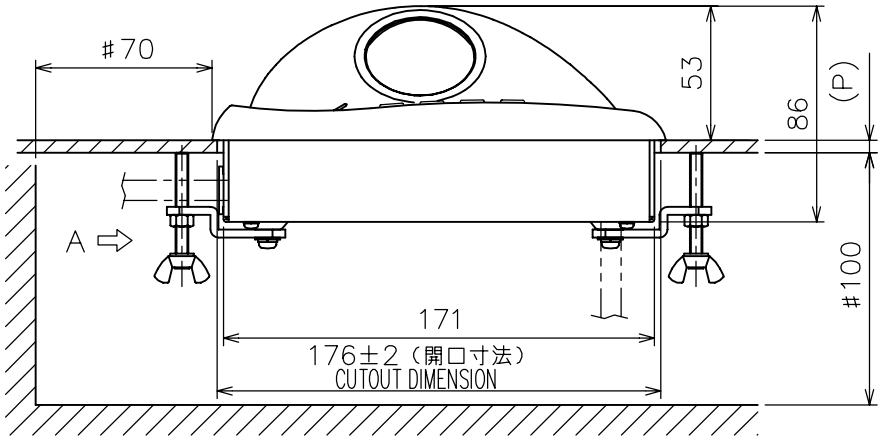
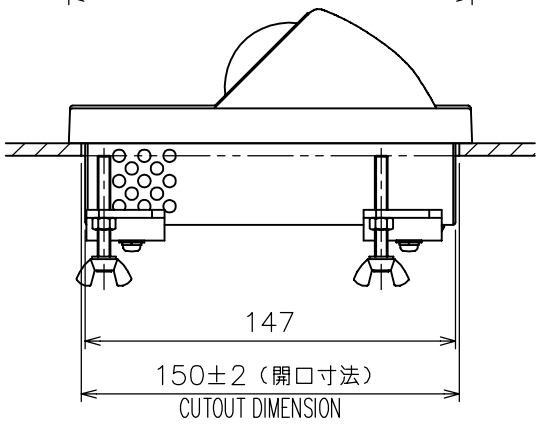



表 1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |




注　記

1）＃印寸法は最小サービス空間寸法とする。
2）指定外の寸法公差は表 1 による。
3）ケーブル導入口は側面・底面から選択のこと。
4）壁の厚さ（P）は最大 10 とする
5）質量はケーブル（10m）を含む

NOTE

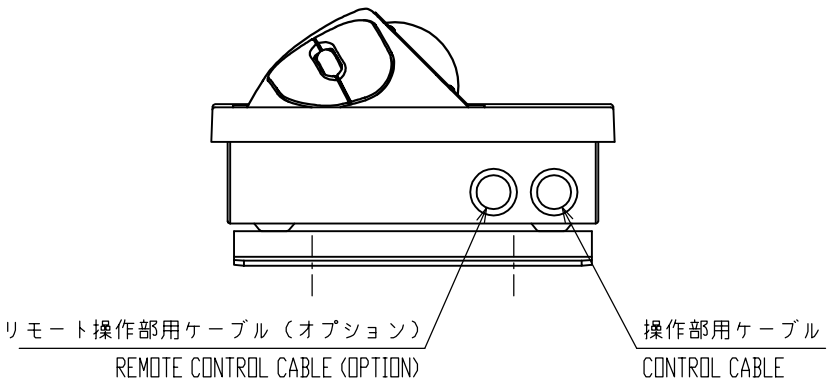
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. SELECT CABLE ENTRY FROM REAR OR SIDE.
4. THICKNESS (P) 10 MM MAX.
5. MASS INCLUDES CABLE (10M).

| | | | |
|---|---|---|---|
| DRAWN Mar. 17 '04 E. MIYOSHI | | | TITLE RCU-015 |
| CHECKED TAKAHASHI. T | | | 名称 トラックボール操作部（埋込装備） |
| APPROVED Y. Hatai | | FAR-2117 SER. | 外寸図 |
| SCALE 1/3 | MASS 2.5 ±10% kg | 質量は10mケーブル重さを含む。 MASS W/ 10m CABLE | NAME TRACKBALL CONTROL UNIT (FLUSH MOUNT) |
| DWG.No. C3519-G14- C | | 03-163-786G-2 | OUTLINE DRAWING |



FURUNO ELECTRIC CO., LTD.

FURUNO



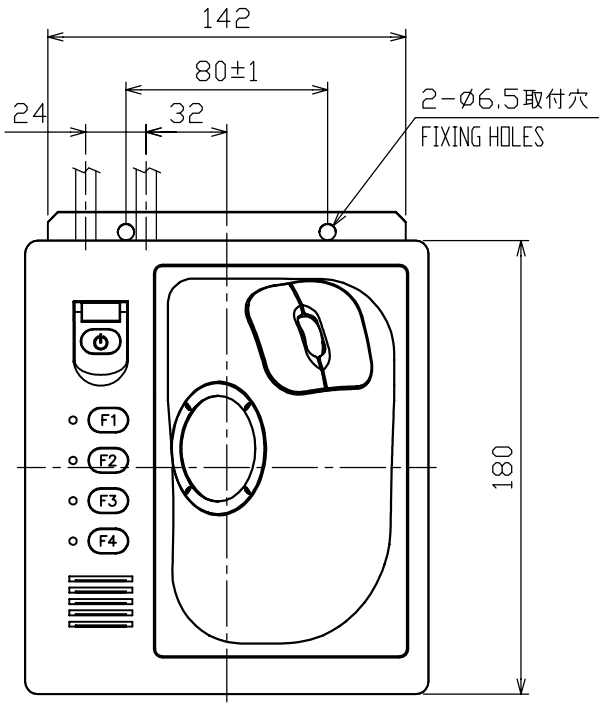
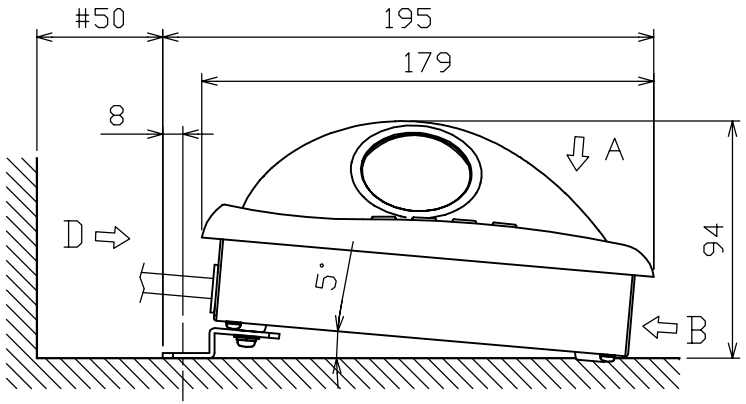



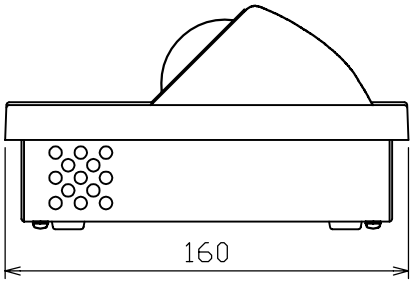

表１ TABLE 1

| 寸法区分（ｍｍ） DIMENSIONS | 公差（ｍｍ） TOLERANCE |
|---|---|
| L≦50 | ±1．5 |
| 50<L≦100 | ±2．5 |
| 100<L≦500 | ±3 |

矢視D
VIEW D




矢視A
VIEW A




矢視B
VIEW B

注　記

１） ＃印寸法は最小サービス空間寸法とする。
２） 指定外の寸法公差は表１による。
３） 取付にはトラスタッピンネジ呼び径６またはＭ６ボルトを使用のこと。
４） 質量はケーブル（１０ｍ）を含む

NOTE

1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WITCH IS NOT SPECIFIED.
3. USE TAPPING SCREWS φ6 OR M6 BOLTS FOR FIXING THE UNIT.
4. MASS IN CLUDES CABLE (10M).

| | | | |
|---|---|---|---|
| DRAWN Jan. 7 '04 E. MIYOSHI | | TITLE | RCU-015 |
| CHECKED Takahashi T. | | 名称 | 操作部（取付金具装備） |
| APPROVED Y. Hatai | FAR-2117 SER. | | 外寸図 |
| SCALE 1/3 MASS 2.5 ±10% kg | 質量は10mケーブル重さを含む。 MASS W/ 10m CABLE | NAME | CONTROL UNIT (TABLETOP MOUNT W/ FIXTURE) |
| DWG.No. C3519-G15- B | 03-163-787G-1 | | OUTLINE DRAWING |

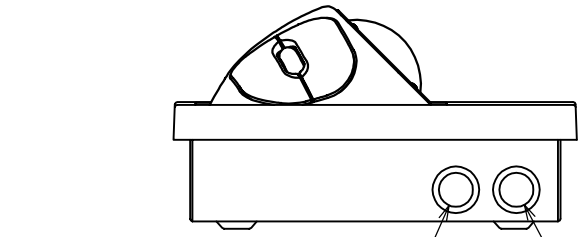


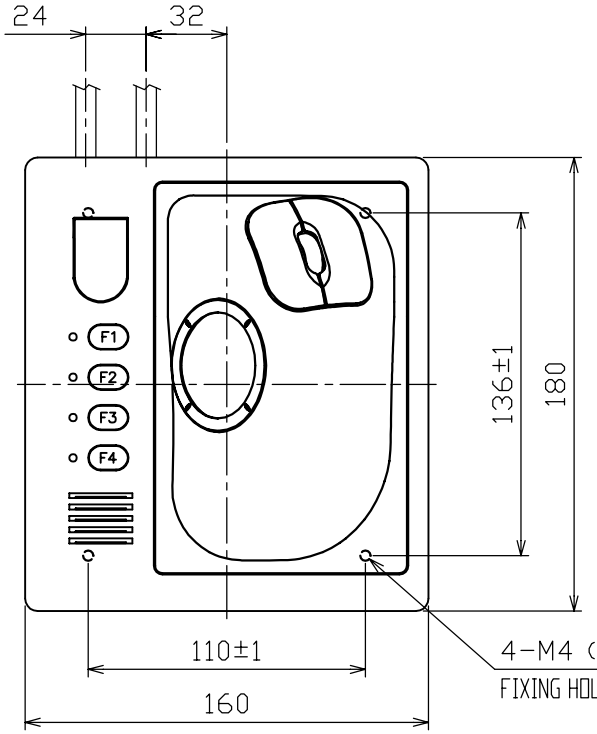
FURUNO ELECTRIC CO., LTD.

FURUNO

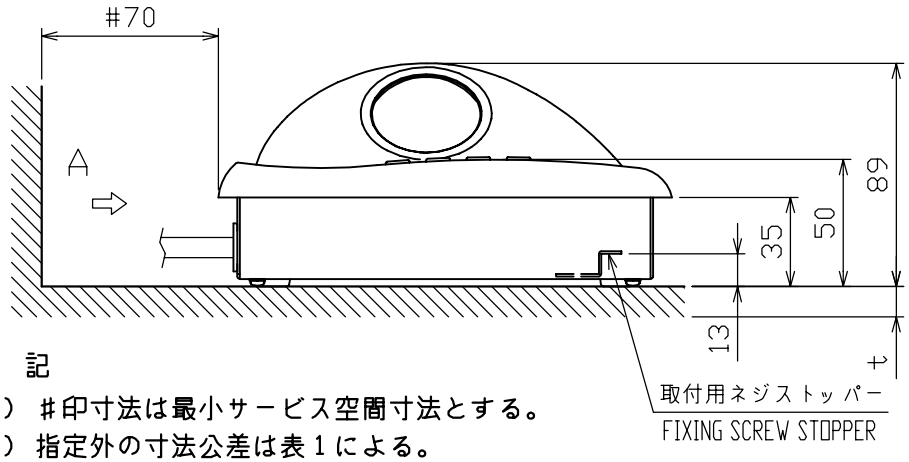
表１ TABLE 1

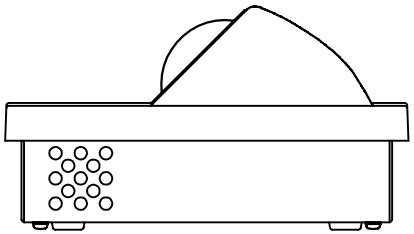
| 寸法区分（ｍｍ） DIMENSIONS | 公差（ｍｍ） TOLERANCE |
|---|---|
| L≦50 | ±1．5 |
| 50<L≦100 | ±2．5 |
| 100<L≦500 | ±3 |




矢視A
VIEW A



NOTE

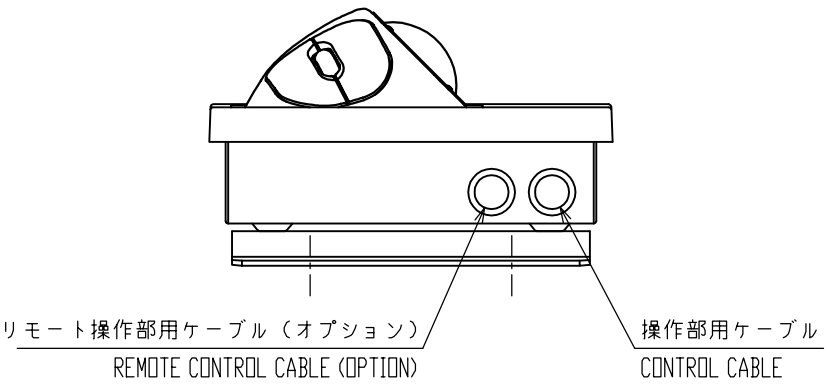
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M4x12 SCREWS FOR FIXING.
   THICKNESS OF MOUNTING SURFACE SHOULD BE 2.5 CM.
   FOR GREATOR THICKNESS USE SCREW
   WHOSE LINGTH IS (M4X(t+7.8)) ±2.
4. MASS INCLUDES CABLE (10).

注　記

１） ＃印寸法は最小サービス空間寸法とする。
２） 指定外の寸法公差は表１による。
３） 取付用ネジはセムスB（M4X12）を使用のこと。
　　取付面板厚は最小2最大5とする。
　　それ以外はネジ長さ（M4X（t+7．8））±2
　　のセムスBを使用のこと。
４） 質量はケーブル（10m）を含む

| | | | |
|---|---|---|---|
| DRAWN June. 19 '03 E. MIYOSHI | | TITLE | RCU-016 |
| CHECKED Takahashi T. | | 名称 | 操作部（卓上装備） |
| APPROVED Y. Hatai | FAR-2117 SER. | | 外寸図 |
| SCALE 1/3 MASS 2.4 ±10% kg | 質量は10mケーブル重さを含む。 MASS W/ 10m CABLE | NAME | CONTROL UNIT (DESKTOP MOUNT) |
| DWG.No. C3519-G16- B | 03-163-780G-3 | | OUTLINE DRAWING |

FURUNO



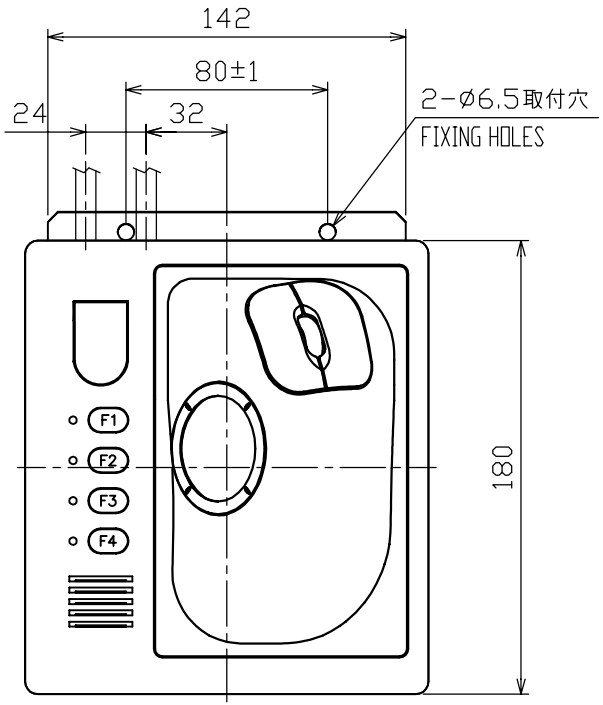
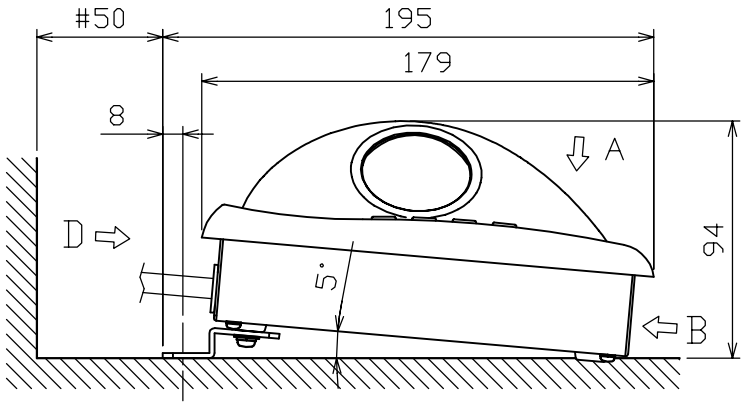



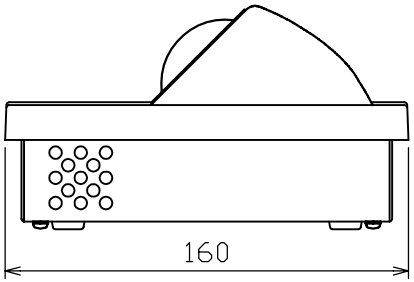

表１ TABLE 1

| 寸法区分（ｍｍ） DIMENSIONS | 公差（ｍｍ） TOLERANCE |
|---|---|
| L≦50 | ±1．5 |
| 50<L≦100 | ±2．5 |
| 100<L≦500 | ±3 |

矢視D
VIEW D




矢視A
VIEW A




矢視B
VIEW B

注　記

１） ＃印寸法は最小サービス空間寸法とする。
２） 指定外の寸法公差は表１による。
３） 取付用ネジはトラスタッピンネジ呼び径６、またはＭ６ボルトを使用のこと。
４） 質量はケーブル（１０ｍ）を含む

NOTE

1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS, WHICH IS NOT SPECIFIED.
3. USE TAPPING SCREWS φ6 OR M6 BOLTS FOR FIXING THE UNIT.
4. MASS IN CLUDES CABLE (10M).

| | | | |
|---|---|---|---|
| DRAWN Jan. 7 '04 E. MIYOSHI | | TITLE | RCU-016 |
| CHECKED Takahashi T. | | 名称 | 操作部（取付金具装備） |
| APPROVED Y. Hatai | FAR-2117 SER. | | 外寸図 |
| SCALE 1/3 MASS 2.5 ±10% kg | 質量は10mケーブル重さを含む。 MASS W/ 10m CABLE | NAME | CONTROL UNIT (TABLETOP MOUNT W/ FIXTURE) |
| DWG.No. C3519-G12- B | 03-163-782G-1 | | OUTLINE DRAWING |

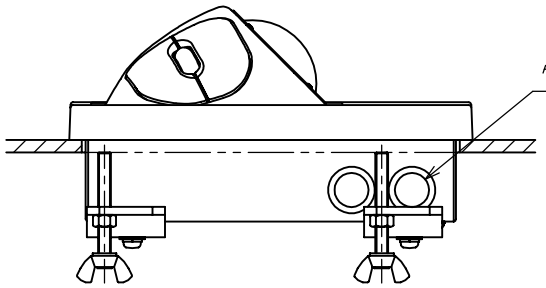


FURUNO ELECTRIC CO., LTD.

FURUNO

操作部用ケーブル
CONTROL UNIT CABLE

リモート操作部用ケーブル（オプション）
REMOTE CONTROL UNIT CABLE (OPTION)




矢視A
VIEW A

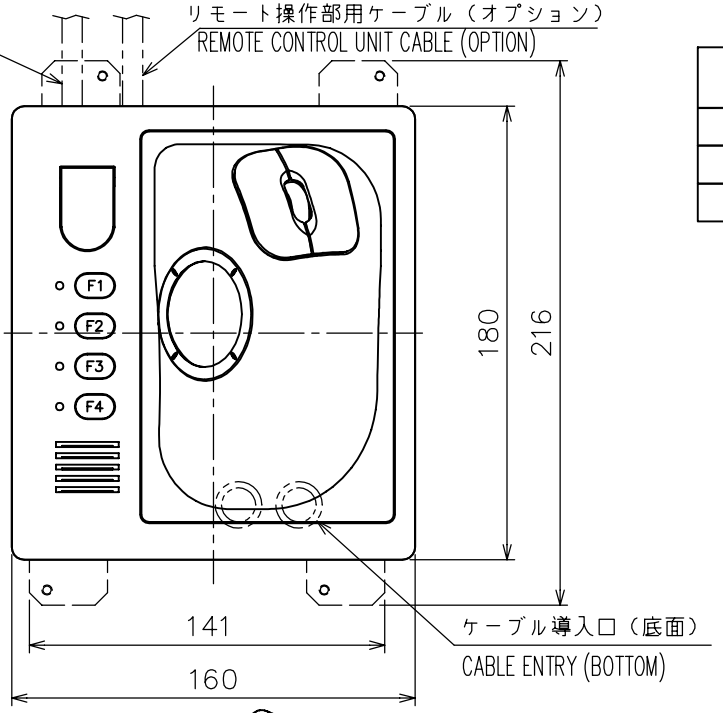
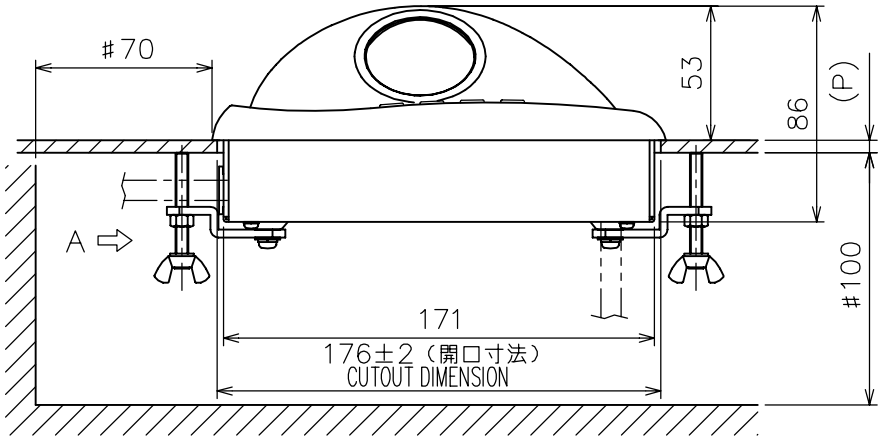
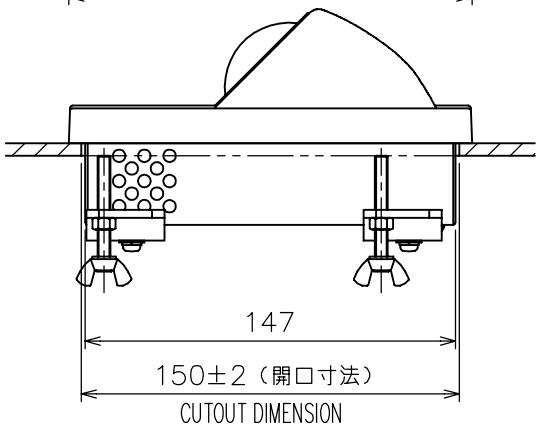



表1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |




注　記
1）＃印寸法は最小サービス空間寸法とする。
2）指定外の寸法公差は表1による。
3）ケーブル導入口は側面・底面から選択のこと。
4）壁の厚さ（P）は最大10とする
5）質量はケーブル（10m）を含む

NOTE
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS. WHICH IS NOT SPECIFIED.
3. SELECT CABLE ENTRY FROM REAR OR SIDE.
4. THICKNESS (P) 10 MM MAX.
5. MASS INCLUDES CABLE (10M).

| | | | |
|---|---|---|---|
| DRAWN Jan. 17 '04 E. MIYOSHI | | TITLE | RCU-016 |
| CHECKED TAKAHASHI. T | | 名称 | リモート操作部（埋込装備） |
| APPROVED Y. Hatai | FAR-2117 SER. | | 外寸図 |
| SCALE 1/3 MASS 2.5 ±10% kg | 質量は10mケーブル重さを含む。 MASS W/ 10m CABLE | NAME | REMOTE CONTROL UNIT (FLUSH MOUNT) |
| DWG.No. C3519-G11- C | 03-163-781G-3 | | OUTLINE DRAWING |

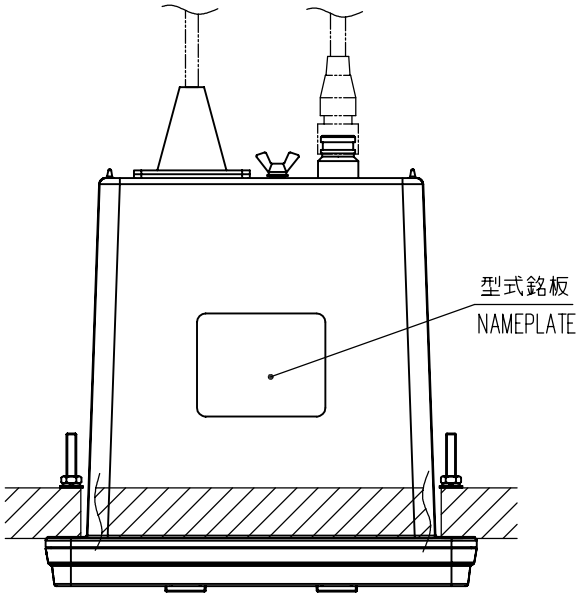


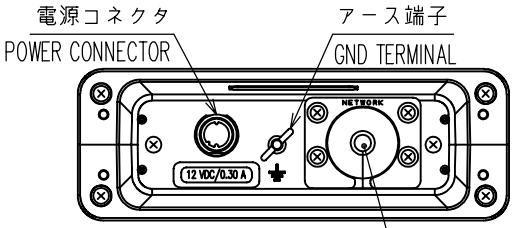
FURUNO ELECTRIC CO., LTD.

FURUNO

表 1 TABLE 1

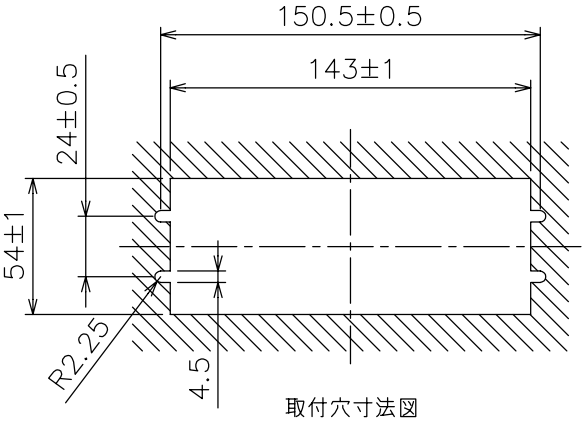
| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |



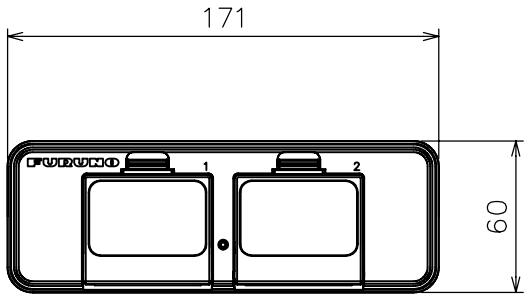



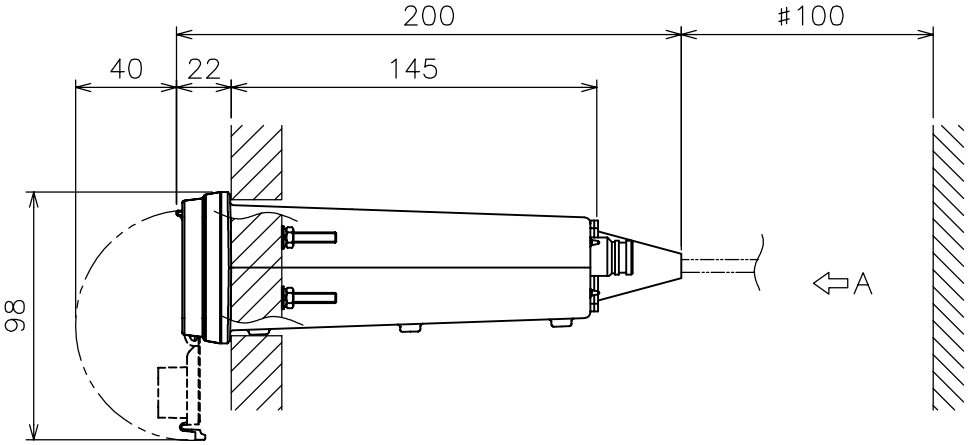

矢視A
VIEW A

イーサネットコネクタ
ETHERNET CONNECTOR




取付穴寸法図
CUTOUT DIMENSIONS




注　記　1）　取付はＭ４Ｘ５０寸切りボルト、Ｍ４平座金、
Ｍ４バネ座金、Ｍ４ナット使用のこと。
2）　＃印寸法は最小サービス空間寸法とする。
3）　指定外の寸法公差は表１による。

NOTE 1. USE M4X50 BOLTS, M4 FLAT WASHERS,
M4 SPRING WASHERG AND M4 NUTS FOR FIXING.
2. #: MINIMUM SERVICE CLEARANCE.
3. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

| | | | |
|---|---|---|---|
| DRAWN Mar. 29 '04 E. MIYOSHI | FAR-2117 SERIES | TITLE | CU-200 |
| CHECKED TAKAHASHI. T | MODEL 1833C | 名称 | 防水型カードインターフェイス(埋込装備) |
| APPROVED Y. Hatai | MODEL 1833C-BB | | 外寸図 |
| SCALE 1/3 MASS 0.8 ±10% kg | | NAME | MEMORY CARD INTERFACE UNIT (FLUSH MOUNT) |
| DWG.No. C3532-G04- B | 19-023-300G-1 | | OUTLINE DRAWING |

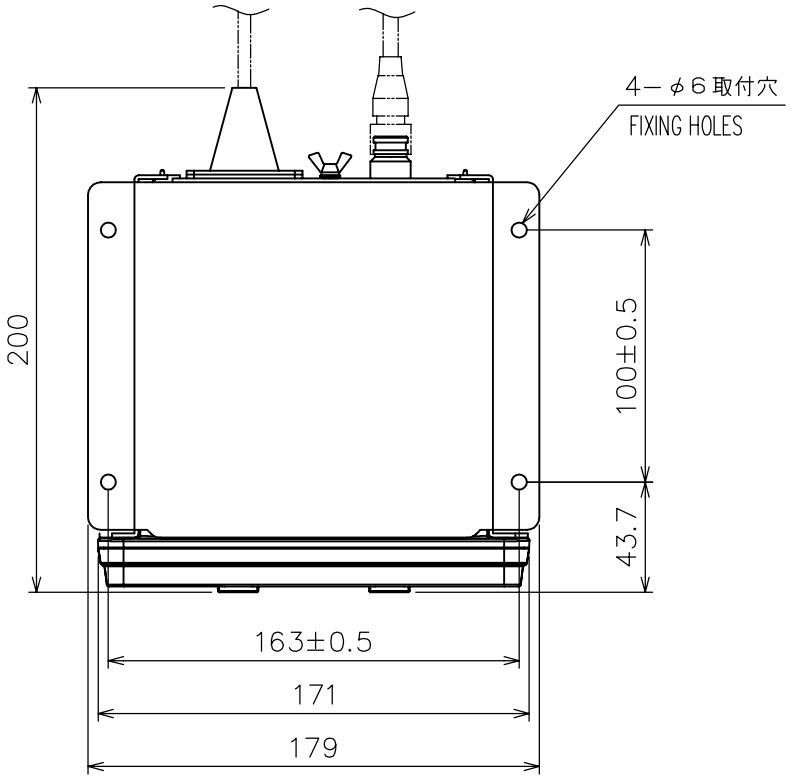


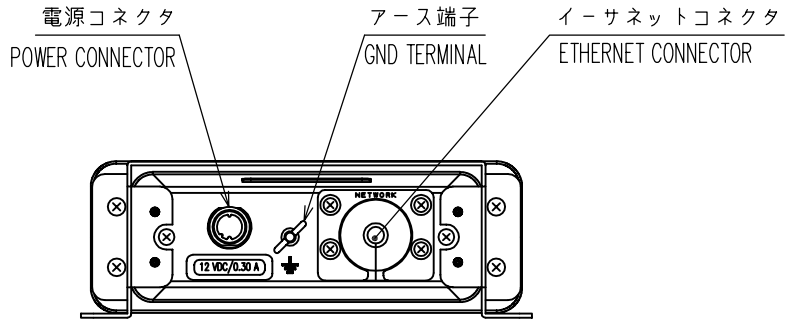
FURUNO ELECTRIC CO., LTD.

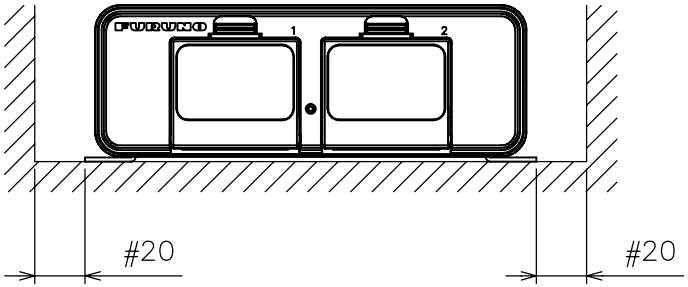
FURUNO

表 1 TABLE 1

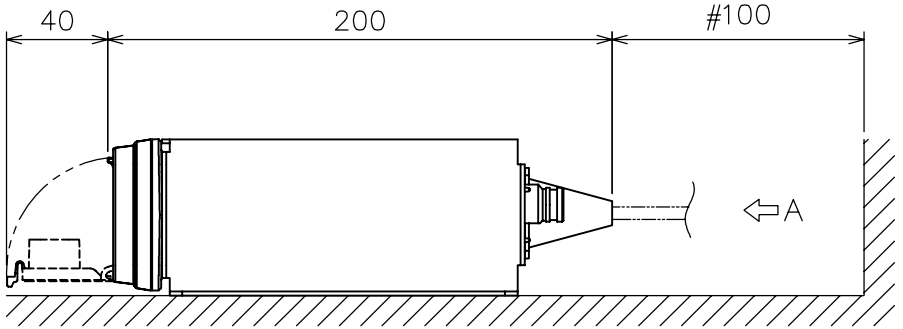
| 寸法区分 (mm) DIMENSIONS | 公差 (mm) TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |




矢視 A
VIEW A




注　記　1）　#印寸法は最小サービス空間寸法とする。
2）　指定外の寸法公差は表１による。
3）　取付用ネジは＋トラスタッピンネジ呼び径５×２０を使用のこと。

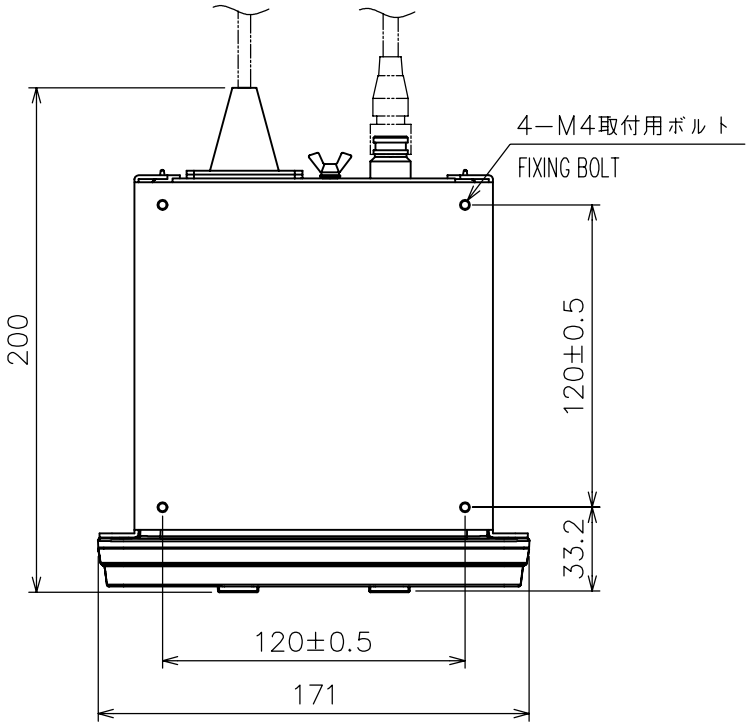
NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE SELF-TAPPING SCREWS 5X20 FOR FIXING THE UNIT.

| | | | |
|---|---|---|---|
| DRAWN Mar. 29.'04 E. MIYOSHI | FAR-2117 SERIES | TITLE | CU-200 |
| CHECKED TAKAHASHI. T | MODEL 1833C | 名称 | 防水型カードインターフェイス(卓上装備) |
| APPROVED Y. Hatai | MODEL 1833C-BB | | 外寸図 |
| SCALE 1/3 MASS 1.3 ±10% kg | | NAME | MEMORY CARD INTERFACE UNIT (TABLETOP MOUNT) |
| DWG.No. C3532-G05- B | 19-023-3106-1 | | OUTLINE DRAWING |



FURUNO ELECTRIC CO., LTD.

FURUNO




注　記

1）　#印寸法は最小サービス空間寸法とする。
2）　指定外の寸法公差は表１による。
3）　取付用ナットはＭ４ナットを使用のこと。
4）　取付板厚は最大８ｍｍとする。

NOTE

1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE NUT M4 FOR FIXING THE UNIT.
4. MAX. MOUNTING BASE THICKNESS IS 8 MM.

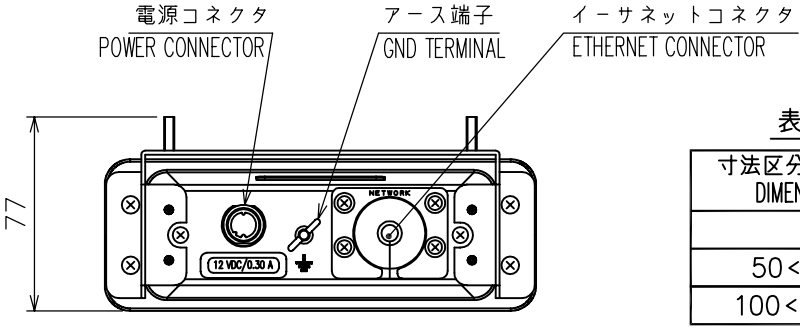
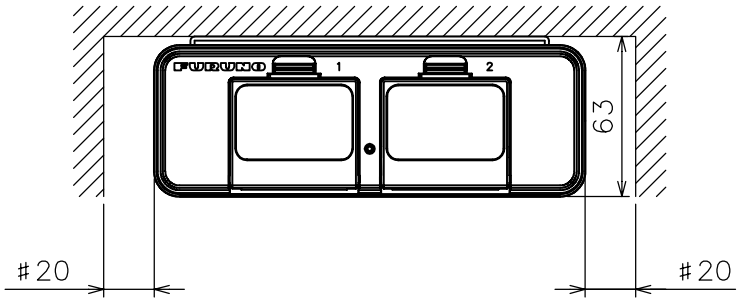
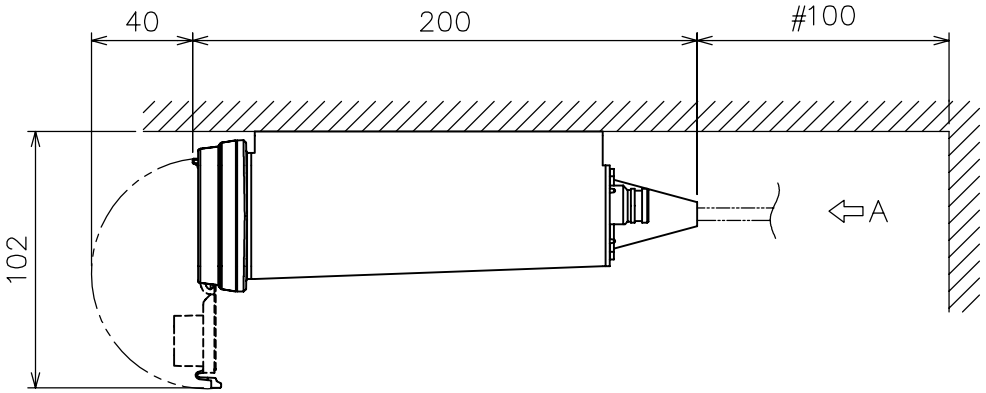



表 1 TABLE 1

| 寸法区分（mm） DIMENSIONS | 公差（mm） TOLERANCE |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |

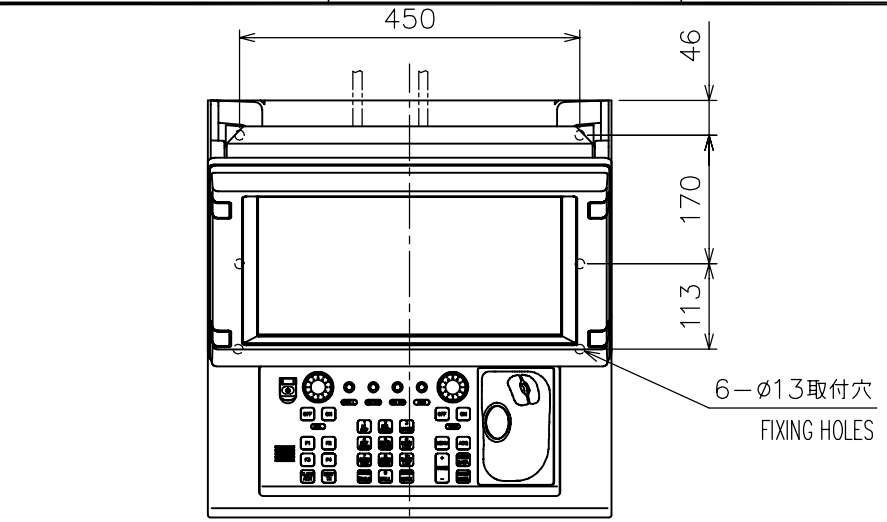


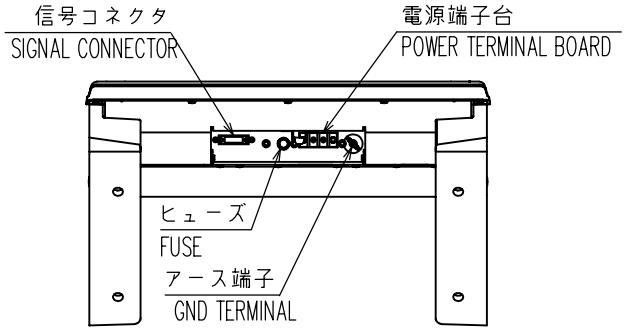

矢視Ａ
VIEW A




| | | | |
|---|---|---|---|
| DRAWN Mar. 29.'04 F. MIYOSHI | FAR-2117 SERIES | | TITLE CU-200 |
| CHECKED TAKAHASHI. T | MODEL 1833C | | 名称 防水型カードインターフェイス(天井装備) |
| APPROVED Y. Hatai | MODEL 1833C-BB | | 外寸図 |
| SCALE 1/3 MASS 1.3 ±10% kg | | | NAME MEMORY CARD INTERFACE UNIT (OVERHEAD MOUNT) |
| DWG.No. C3532-G06- B | 19-023-320G-1 | | OUTLINE DRAWING |

FURUNO

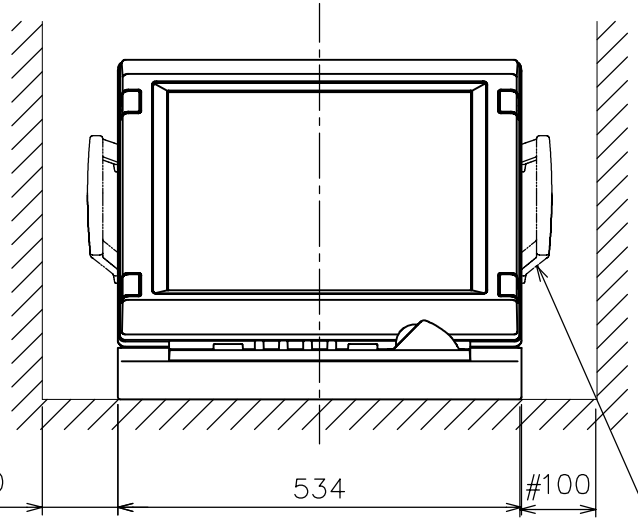


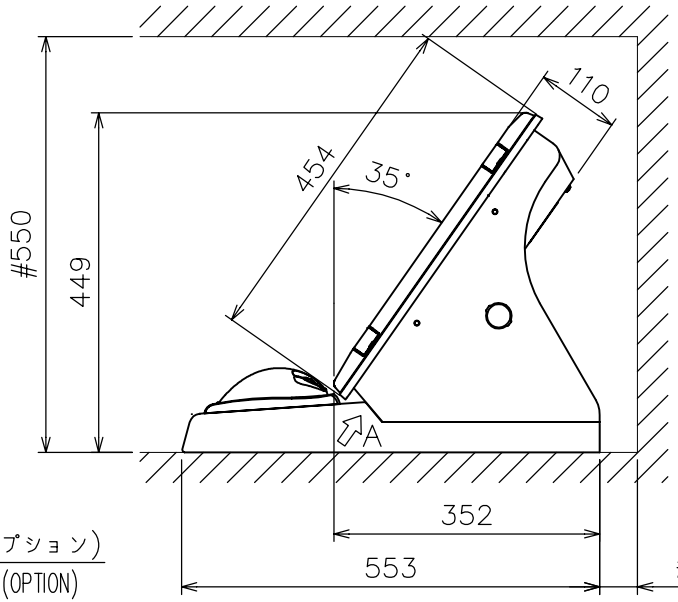



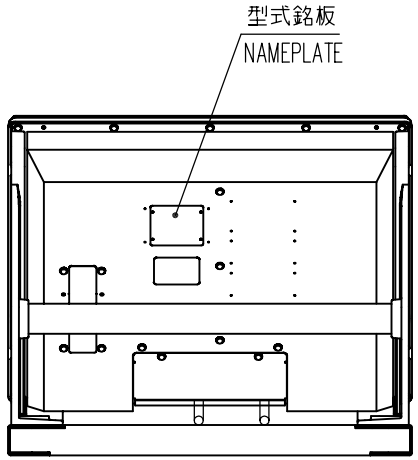

矢視 A
VIEW A

表 1 TABLE 1

| 寸法区分（mm） DIMENSIONS (mm) | 公差（mm） TOLERANCE (mm) |
|---|---|
| L≦50 | ±1．5 |
| 50<L≦100 | ±2．5 |
| 100<L≦500 | ±3 |
| 500<L≦1000 | ±4 |



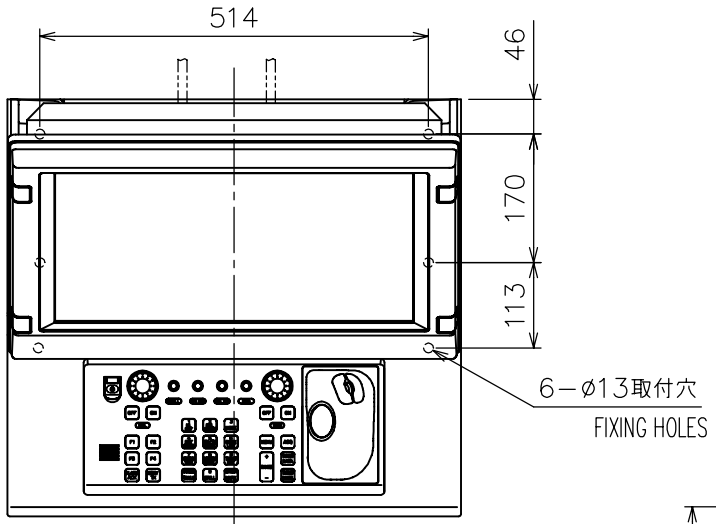

注　記　1）　＃印寸法は最小サービス空間寸法とする。
　　2）　指定外の寸法公差は表１による。
　　3）　取付用ネジはＭ１０ボルト、またはコーチボルト呼び径９を使用のこと。
　　4）　質量は操作部ケーブル（１０ｍ）を含む。

NOTE　1. #: MINIMUM SERVICE CLEARANCE.
　　2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　3. USE M10 BOLTS OR COACH SCREWS ø9 FOR FIXING THE UNIT.
　　4. MASS INCLUDES CONTROL CABLE (10m).

| | | | |
|---|---|---|---|
| DRAWN Mar. 18 '04 E. MIYOSHI | | | TITLE MU-201CR w/ RCU-014 |
| CHECKED TAKAHASHI. T | | | 名称 指示部（連結台タイプ） |
| APPROVED Y. Hatai | FAR-2107 | | 外寸図 |
| SCALE 1/10 MASS 27 ±10% kg | | | NAME DISPLAY UNIT (COMBINATION TYPE) |
| DWG No. C3519-G27-A | 03-163-7606-2 | | OUTLINE DRAWING |

FURUNO ELECTRIC CO., LTD.

FURUNO



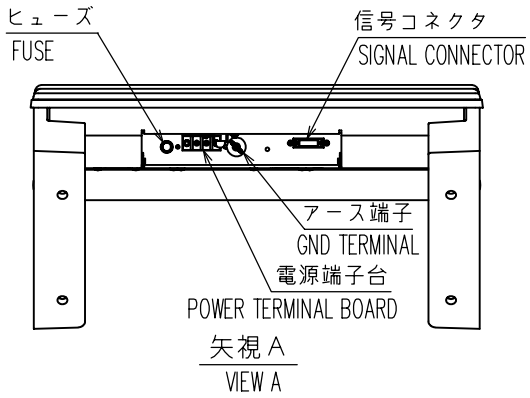
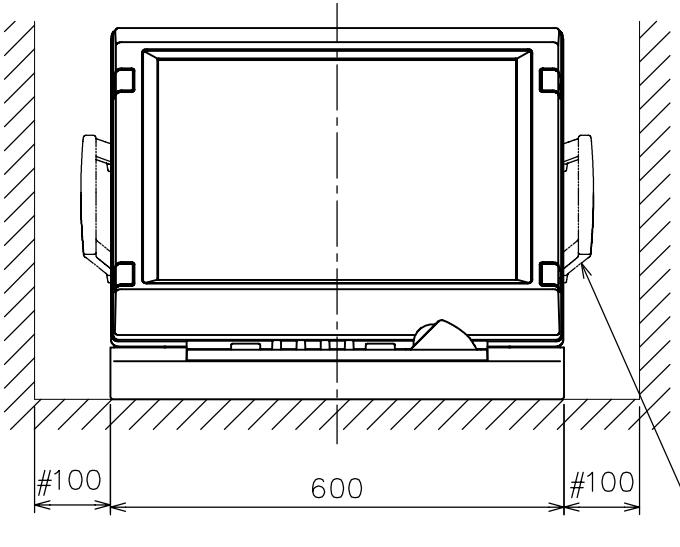
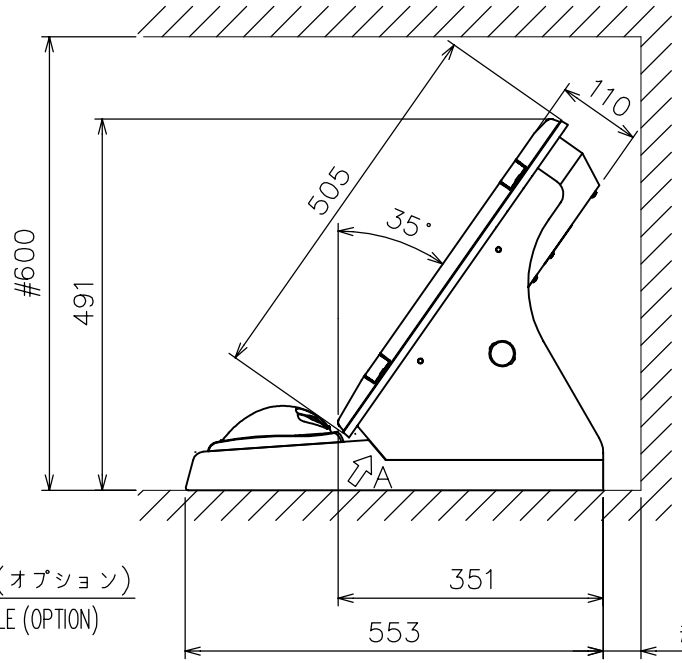
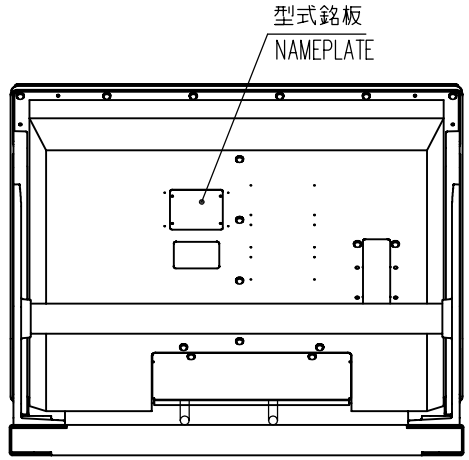




表 1 TABLE 1

| 寸法区分（mm） DIMENSIONS (mm) | 公差（mm） TOLERANCE (mm) |
|---|---|
| L≦50 | ±1.5 |
| 50<L≦100 | ±2.5 |
| 100<L≦500 | ±3 |
| 500<L≦1000 | ±4 |




注 記 1） #印寸法は最小サービス空間寸法とする。
2） 指定外の寸法公差は表１による。
3） 取付用ネジはＭ１０ボルト、またはコーチボルト呼び径９を使用のこと。
4） 質量は操作部ケーブル（１０ｍ）を含む。

NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE M10 BOLTS OR COACH SCREWS ø9 FOR FIXING THE UNIT.
4. MASS INCLUDES CONTROL CABLE (10m).

| | | | |
|---|---|---|---|
| DRAWN Mar. 18 '04 E. MIYOSHI | | | TITLE MU-231CR w/ RCU-014 |
| CHECKED TAKAHASHI. T | | | 名称 指示部（連結台タイプ） |
| APPROVED Y. Hatai | FAR-2807 | | 外寸図 |
| SCALE 1/10 MASS 33 ±10% kg | | | NAME DISPLAY UNIT (COMBINATION TYPE) |
| DWG No. C3524-G07- A | 03-163-761G-2 | | OUTLINE DRAWING |



FURUNO ELECTRIC CO., LTD.

FURUNO

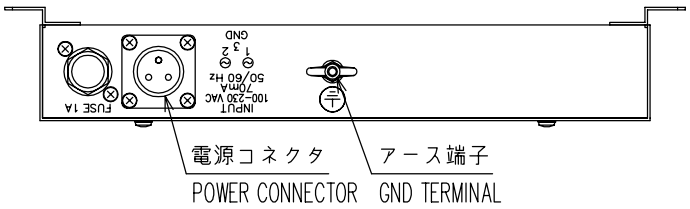
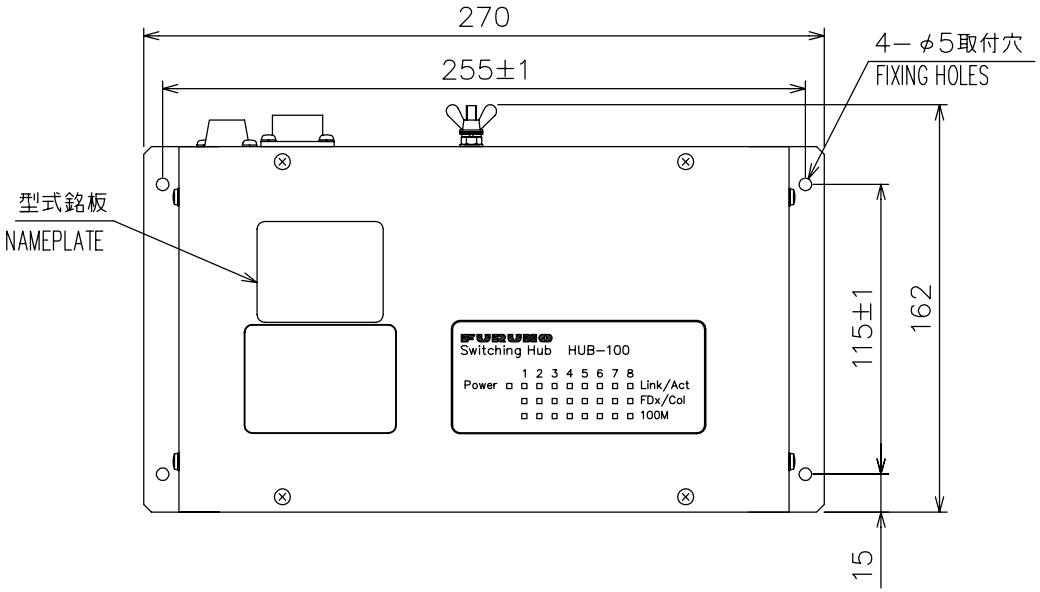



表 1　TABLE 1

| 寸法区分（ｍｍ）<br>DIMENSIONS | 公差（ｍｍ）<br>TOLERANCE |
|---|---|
| Ｌ≦５０ | ±１．５ |
| ５０<Ｌ≦１００ | ±２．５ |
| １００<Ｌ≦５００ | ±３ |

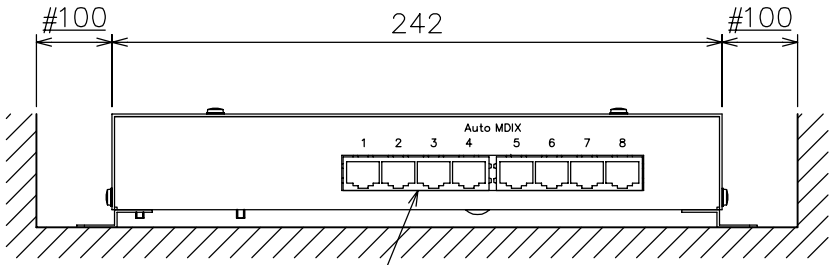


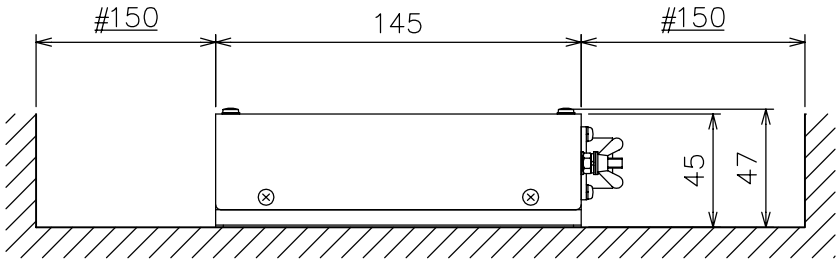

注　記

１）　取付用ネジはトラスタッピングネジ呼び径４×１６を使用のこと
２）　指定外寸法公差は表１による
３）　＃印寸法は最小サービス空間寸法とする

NOTE

1. USE TAPPING SCREWS 4x16 FOR FIXING THE UNIT.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. #: MINIMUM SERVICE CLEARANCE.



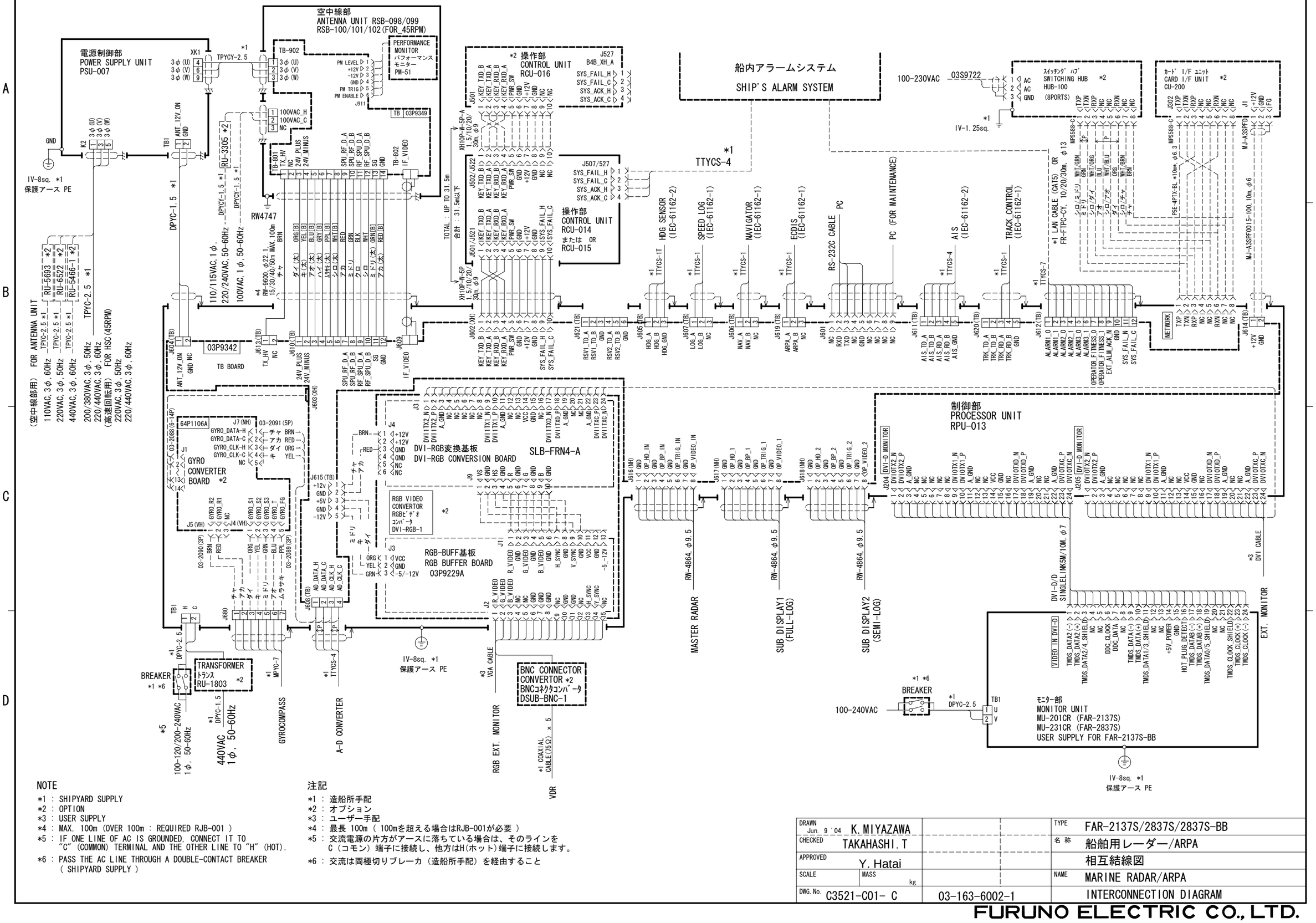




| | | | |
|---|---|---|---|
| DRAWN Mar. 31 '04 T.YAMASAKI | | | TITLE HUB-100 |
| CHECKED Mar. 31 '04 T.MATSUGUCHI | | | 名称 イーサネットスイッチングハブ |
| APPROVED Apr.05'04 T.Matsuguchi | | | 外寸図 |
| SCALE 1/3 | MASS 1.5 ±10% kg | | NAME SWITCHING HUB |
| DWG.No. C3519-G18- B | | 03-163-960G-2 | OUTLINE DRAWING |



FURUNO ELECTRIC CO., LTD.

FURUNO




NOTE

*1 : SHIPYARD SUPPLY
*2 : OPTION
*3 : USER SUPPLY
*4 : MAX. 100m (OVER 100m : REQUIRED RJB-001 )
*5 : IF ONE LINE OF AC IS GROUNDED, CONNECT IT TO "C" (COMMON) TERMINAL AND THE OTHER LINE TO "H" (HOT).
*6 : PASS THE AC LINE THROUGH A DOUBLE-CONTACT BREAKER ( SHIPYARD SUPPLY )

注記

*1 : 造船所手配
*2 : オプション
*3 : ユーザー手配
*4 : 最長 100m ( 100mを超える場合はRJB-001が必要 )
*5 : 交流電源の片方がアースに落ちている場合は、そのラインを C (コモン) 端子に接続し、他方はH(ホット)端子に接続します。
*6 : 交流は両極切りブレーカ (造船所手配) を経由すること

| | | | |
|---|---|---|---|
| DRAWN Jun. 9 '04 K.MIYAZAWA | | TYPE | FAR-2137S/2837S/2837S-BB |
| CHECKED TAKAHASHI.T | | 名 称 | 船舶用レーダー/ARPA |
| APPROVED Y.Hatai | | | 相互結線図 |
| SCALE | MASS kg | NAME | MARINE RADAR/ARPA |
| DWG.No. C3521-C01- C | 03-163-6002-1 | | INTERCONNECTION DIAGRAM |

FURUNO ELECTRIC CO., LTD.

# Errata Sheet

# FAR-2117/2127/2817/2827 Installation Manual

**IME-35190-C**

# FAR-2137S/2837S Installation Manual

**IME-35210-C**

3-1 page

Correct

| S1 | Monitor SXGA for FAR-2117/2127/2137S (Default) | Monitor UXGA for FAR2817/2827/2837S (MU-231CR S. No. 0269 and later) | FAR-2117-BB FAR-2127-BB FAR-2137S-BB |
|---|---|---|---|
| 1 | OFF | ON | OFF |
| 2 | OFF | OFF | ON |
| 3 | Not used. | | |
| 4 | | | |

**Note:** Set #1 and #2 of S1 to OFF for MU-231CR S. No. 0268 and earlier.

Wrong

| S1 | Monitor SXGA for FAR-2117/2127/2137S (Default) | Monitor UXGA for FAR2817/2827/2837S | FAR-2117-BB FAR-2127-BB FAR-2137S-BB |
|---|---|---|---|
| 1 | OFF | ON | OFF |
| 2 | OFF | OFF | ON |
| 3 | Not used. | | |
| 4 | | | |